

# AVIATION WEEK

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1950

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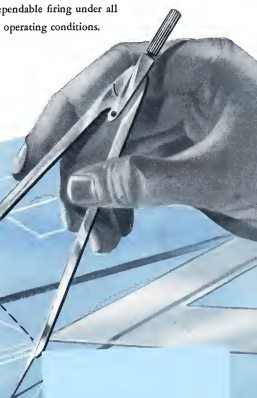
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## NEWS DIGEST

### DOMESTIC

Stiles at Wright Aeronautical Corp. ended when the company granted hourly workers a pay increase of 14 cents and a 55.40 weekly pay rate to salaried employees. With one striking AFL worker at the Garden Propeller Division included in the general wage boost, C-W figures the pay rate increase to reach \$4,006,000 annually.

Tram World Airlines will start scheduled overnight routes to coast airports with DC-6s in Nov. 1. The new service will increase TWA's present cargo-loading capacity threefold, says cargo sales manager J. E. Ross.

Sperry Corp. has purchased from the government an air-enclosed press the plant and adjoining 144 acres of land at Lake Success, L. I., N. Y., built or occupied on a lease during World War II. The buildings are now jointly owned by Sperry Corporation Co. Division and the Scientific Headquarters of the United Nations.

An F-4U replica has been placed with Douglas Aircraft Co. for 15 sets with replicas of the DC-3A, designated C-119B. USAF also has ordered 10 military Super Constellation from Lockheed, designating them C-521C.

Ryan Aeronautical Co. will expand production of four planes. Navajo has been placed after completion of its current schedule of 150, expected early next year. Entire Ryan facilities will be devoted to military production, including military versions of the Navajo if contracts now under discussion are forthcoming.

An Cough Transport Air members will refuse to accept future business from two ticket agencies accused of credit violations and misrepresentation. They are Columbus Airmail Station and the Flying Ticketing Agency. The two agencies have been expelled from ACTA membership, but ACTA claims will honor tickets bought from the agencies prior to the expulsion.

General Electric Co. will move the generator and expander staff at its Aircraft Gas Turbine Division from Lynn, Mass., to its J-47 assembly plant at Lakeland, Ohio. GE will take over additional space at Lakeland.

Henry A. Basso, four and aviation publicist, was presented the McCough Memorial Award by Gen. George C. Ensey, Commandant of the Air Corps

at the American Legion Air Service Post 701 dinner in New York. The award is an recognition of Basso's 40 years of service to the aviation industry.

James M. Verner has been appointed executive assistant to CAB Chairman Dilus W. Rentzel. Verner comes to the CAB as an attorney in the office of the fiscal control in 1944. After a stint in the Navy during the war and serving as an attorney for Chicago & Southern Air Lines and the Air Transport Union, he returned to CAB as liaison in a former capacity, in which capacity he served until the appointment.

Planned aircraft repairs by main bases in September totaled 37 planes valued at \$19,452. Aircraft maintenance base repairs August totals were 35 planes valued at \$16,648.

Forecast of military aircraft will be handled by the Military Air Transport Service's 375th Ferrying Squadron out of Kelly AFB, San Antonio, Tex. The squadron has an authorized strength of 90 officers and 188 airmen. In World War II production, the Air Transport Command's Ferrying Division, had at its peak about 90,000 AAF and civilian personnel.

### FINANCIAL

Norfolk Aircraft, Inc. reports loss for fiscal year ending July 31, 1948 of \$249,915 at an expense of \$43,911, 594. Norfolk turned in an operating profit of \$2,461,436, but charged off a loss of \$2,486,799 on its USAF C-119 contract.

United Air Lines reports profit of \$4,174,626 for nine months ending Sept. 30. Third quarter profit was \$4,724,296, offsetting a fourth loss.

### INTERNATIONAL

France and Italy still are holding up Pan American Airways proposed Paris and Rome routes. Still agreed on the ground of providing the Rome operation, but differed when France continued to object.

Royal Canadian Air Force has taken delivery on the last five of 100 newly delivered North American T-51 Mustang fighters.

Garrett will call on foreign experts to investigate investigation of the country's workers. Until recently, Duce companies were operating T-6, E-11 A & B, partly owned by British Airways, and A-6, a freight line. Last month, T-6 and E-11 A & B were directed to combine their services.

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## AVIATION CALENDAR

- Oct. 10-11, Nov. 1—Flight Safety Foundation annual Safety Seminar, Denver, Colo.
- Nov. 1-5—European general convention, National Aviation Trades Assn. Class Hotel, St. Louis
- Nov. 2-3—General annual meeting and opening conference, sponsored by Utah region, State Aeronautics Commission, State Dept. of Agriculture and State College, Salem, Wash.
- Nov. 3-13—50th annual meeting, The Magnesian Assn., Belmont Hotel, N. Y.
- Nov. 5-20—Society of Automotive Engineers national body and laboratory meeting, The Motor Hotel, Okla.
- Nov. 18-20—20th rules of the air and air traffic control meeting, South shore, Montreal, Canada
- Nov. 18-20—General Board Meeting, sponsored by Elston Arms Storage Corp., Elston, Ill.
- Nov. 20-Dec. 1—This month meeting American Society of Mechanical Engineers, Hotel Statler, New York
- Nov. 21-19—Airport line safety clinic sponsored by the National Fire Protection Assn. committee on aviation and airport fire protection, Baker Hotel, Dallas
- Nov. 21-Dec. 1—Flight annual meeting of Aviation Distributors and Manufacturers Assn., Americana Hotel, Los Angeles
- Nov. 22—Airport line safety clinic, sponsored by Committee on Aviation and Airport Fire Protection of the National Fire Protection Assn., Hotel Statler, Dallas
- Dec. 7-12—Action rule of aeromedical body, former, present, past and the future, Plaza Astoria Rooms 1 & 2, St. New York
- Dec. 8—Aviation Association and donor, Yonkers Hotel, Philadelphia
- Dec. 10-14—Wallops Eastern Lecture, Institute of Aeronautical Sciences, 2 & 3 Chambers of Commerce Hotel, Washington, D. C.
- Jan. 6-7, 1951—Florida Air Pilot Assn. air show and convention of planes and equipment, Opa Locka Airport, Miami, Fla.
- Jan. 15-18—40th anniversary show and banquet, conditions on plant, aircraft, space techniques, Cleveland Ohio
- Jan. 22-24—1-19th annual meeting of the Society of Aeronautical Sciences, Hotel Statler, N. Y.
- Apr. 14-15—ATA annual engineering and maintenance conference, Hotel Derby, Chicago
- June 12-15—General annual conference on industrial research, conducted by Columbia University Dept. of Industrial Engineering, New York
- Sept. 7-11—Third annual Anglo-American Aeronautical Conference, co-sponsored partly by Royal Aeronautical Society and IAS, Brighton, England
- Sept. 18-14—50th annual international conference and exhibit, sponsored by Institute Society of America, San Antonio Coliseum, Houston, Tex.

### PICTURE CREDITS

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**THE BRASS** Sir Miles Thomas, chairman of British Overseas Airways Corp., and 1952 president of the International Air Transport Assn., receive congratulations. Flanking him are Warren Lee Paxon, TWA chairman and 1950 president (left), Sir Wilham Briston, IATA director general, and Dr. A. F. Fineman, KLM president and 1949 IATA president.



**THE GREETING** Mr. and Mrs. Fred Renshaw, head of airline Museum, greet hosts.



**THE VOYAGE** Mr. and Mrs. Fred Renshaw with the T. T. Evans.



**THE COCKTAIL PARTY** Mrs. Carl Freiler and the president of Northwest Airlines (left), Mrs. and Mr. J. A. Harshaw, IATA secretary, and Mrs. Fanny Demaree, wife of TWA Vice President manager.



**THE EYE** Trying his wits with John Harshaw, BOAC, London, and H. M. Clark, SOAC, New York.

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## WHO'S WHERE

### In the Front Office

Dr. Arthur Elsholz Parker has been appointed head of the chemistry and metallurgy department of Fairchild EDA's Nuclear Energy for Propulsion Aircraft Division and is slated to join the MEPA, reported about New US. Dr. Parker is president of the American Society of Vitreous and is chief metallurgist for Diamond Aircraft Co.

George Irving has been named assistant to the president of Consolidated Vultee Aircraft Corp. Irving began his aviation career with Northrop, Douglas, Curtiss and then in 1936. He subsequently became vice president, assistant general manager and director of Northrop Aircraft, Inc., at Hawthorne. He resigned from that post in 1947.

### Changes

Among the Manufacturing-Jack & Jones men have been made available to the world manager of Western Gas Works and John R. Oliver has been made administrative assistant to the company's general manager. C. E. White has been named chief engineer for Lear Inc. R. M. Ford has joined Avco as technical manager. K. F. Latham has been appointed manager of General Gas Turbine Division.

A. V. Engelmann has been appointed to the staff of General Electric's Aircraft Gas Turbine Division and will also be connected with the company's quality control activities. R. E. Zittler has been named in charge of training for GE's Apprentice department.

John N. Dyer is now in charge of research and engineering for Avco Aero Instruments Laboratory. Lee M. Smith has been made customer field service manager for Northrop Aircraft. Russell Carter has been appointed eastern representative for the General Motors Co. He will continue his representation for Avco's Elva powerplant products.

M. M. Connerman has been retained by United States Rubber Co. as consultant at the company's Cleveland, O. plant. George E. Mankin has been placed in charge of aircraft parts and equipment procurement for W. S. Kilpatrick & Co. N. Y.

Among the Arthur-Robert J. Wilson has been named European sales manager for the Newcomb Industries and E. J. Yelland has been made NWA's Hawaii sales manager.

Thomas J. Parker has been made assistant to the president of Consolidated Vultee Aircraft. Thomas K. Corbett, Jr., has been appointed director of operations for Avco's Avco Division, replacing E. J. Hoyt now on sick leave.

### Honors and Elections

Earl Cook, Jr., assistant to the president of Delta Air Lines, was elected second vice-president of the American League of the second convention at Los Angeles. Cook, at 28, at the youngest man to hold the job Delta felt he will be a "good ambassador" for other air transportation leaders.

## INDUSTRY OBSERVER

As F-100 pilots of three Andrews AFB F-36s that plunged into the Potomac River near Washington, in a formation flight, apparently lost their bearings in the very low visibility conditions which ensued. Two planes were made, killing their pilots, while the third bounced off the water, and flew in damaged condition about a half mile to a forest landing. Preliminary investigation indicates that one structural or mechanical difficulty contributed to the accident involving the three Republic jet fighters.

Research development of the Armstrong Siddeley Sapphire turbojet engine, now rated at 7300 lb. thrust, will take it up to around 9300 lb., an amount close to Curtiss-Wright, which has bought the engine for American production (AVIATION WEEK Oct. 18). Probably the quickest and easiest way would be to add an afterburner, but other improvements are being planned. It is said that a turbojet engine should be able to handle a wide variety of fuels, without appreciable variation in jet performance.

Naval has provided Convair with a new high-speed motor launch to make later towing runs with offshore rescue models at San Diego (AVIATION WEEK Oct. 23).

A scaled-down version of the Martin XB-51, with a tailboom in the rear, has just been suggested to the Air Force as a possible alternate to the larger three jet version as a ground support plane.

Final production orders for three types of guided missiles will be limited to service test quantities, but indicate that a testing point has been reached in missile development in this country.

British sources say that three different developments of ducted fan aircraft engines are at present underway by British powerplant manufacturers.

An experimental model of the Glaser L. Martin Co. Matarok guided missile has been flown under successful control at Holloman AFB for distances of about 500 miles (see page 12).

Most important part of the annual Curtiss-Wright Bristol engine program, agreement, is a deal to make Bristol's Olympus Co's turbojet, one high power turbojet which has been two solid contractors. While this is early development, Olympus is expected to be one of the most powerful jet engines in the world, a considerable step ahead of anything now known to be flying.

Two different helicopter towing procedures with the Sikorsky H-15 have now been used successfully at Wright-Patterson AFB. One calls for the helicopter to take off and hover while the towplane becomes airborne and then low speed is used, when the helicopter power is cut. The other procedure involves a low altitude hover the towplane, with the helicopter supplying enough power to rotate the rotor blades until the indicated speed of the plane is sufficient for the rotor to go into autorotation.

The two-engine Aero Commadore is going into limited production at Oklahoma City in the 150 hp. Licensing version which has already been contracted for by USAF. First order will be for around 15 airplanes. Kerosene Appliance Corp. at Garland is contracting to make major sub-assemblies for the five place plane. It is understood that Aero Design and Engineering Corp. already has been ordered for most of the plane in the first run, at a price estimated to be in the neighborhood of \$75,000.

British European Airways expects that helicopter transports will reduce direct operating costs 25 percent over rotary planes on its flights of about 800 miles, according to Lord Douglas of Kirtland, BEA chairman. He says BEA, in preparing for the introduction of the Viscount, has run up against an unusual crew training problem better-than-over fuel (which is never used) have to carry "loads of reserve fuel in over-engineered" fuel tanks on its early work over fuel tank that the worst kind of stacking.

## Missiles Super-Agency Fast Taking Shape

### Keller of Chrysler and Maj. Gen. Nichols slated for top posts in new organization.

By Ben S. Lee

A top industrialist and a retired Army engineering administrator are slated to lead the new super-agency, Office of Guided Missiles, rapidly taking shape at the Pentagon to speed and coordinate the lagging U. S. guided missile program.

• **K. T. Keller**, Detroit, president of the Chrysler Corp., as director, and • **Maj. Gen. Kenneth D. Nichols**, now vice engineer of the Atomic Energy Project, as deputy director. • **High Estates Body**—The new Office of Guided Missiles is to become top organization for all U. S. guided missile work, reporting directly to the Defense Secretary and the Armed Forces Policy Council. However, it is not programmed as a "Machines Project" type of organization divorced from other military aids, nor does it replace any other present missile agencies in the three services.

Gen. Nichols possibly will set up the actual operating machinery of the new office, drawing from his experience with large industry project coordination problems in World War II.

Establishment of the Office of Guided Missiles again strengthens the guided missile from an area of research to military production of an end-product weapon.

Military sources point that basic new planning will involve missile research and development at a rate of more than \$200 million annually, will be tripled at least if production of more a few missiles is to get under way. Three months now in final test phase will be in production for service use by the end of 1951, these sources state.

A directive, will charge the director of OGM with creating an agency, within the structure of the Defense Department, to coordinate all guided missile research and development and to plan for standardization of the broadest practicable types for production.

• **Director's Duties**—Acting officially as an advisory capacity to the Secretary of Defense and the Armed Forces Policy Council, the Director of OGM, will be

charged specifically with progressing: • **Expeditious** of guided missile production.

• **Efficiency** as to which projects will receive service status for research and development and which are to enter production phase.

• **Coordination** on complete interchange of technical information between Army, Navy and Air Force.

• **Advice** to the services on development and status of guided missile weapon systems.

• **Background**—Adapt of the German V-1 and V-2 during the later stages of World War II, closely followed by the shocking destruction of Hiroshima and Nagasaki by the U. S. developed atomic bombs stimulated the nation into pessimistic belief that push-button war was a reality.

Military thinking, long, was impressed as to the immediate future of guided missile warfare. As a result, development contracts were issued by the three services going back basically to investigations of key missile phase that showed promise.

In 1946, after the percentage of the V-1 program distributed (short of target) by Allied intervention and the merger of test ranges of the V-2 were assumed, a large part of the guided missile contracts were cancelled. The remaining projects, however, retained guarded use since doubts as to the service uses for several consequences of the new weapon.

Duplication of effort and lack of coordination between the services retarded development (reported in *Aviation Week* Mar. 6 and April 24). Duplication was regarded to some quarters as a healthy sign of direction of development, informed quarters, however, deplored it as a waste of time and money.

Finally, efforts of the Atomic Energy Office of the Morrison Bond and the Guided Missiles Committee of the Research and Development Board, both the spreading missile development program to lead and accelerated the almost talk of setting and ordering cancellation of the line producing techniques. Set into being by their joint effort were:



K. T. KELLER—down center in middle.

- **Systems** for comparative evaluation of existing missile research between service.
- **Appraisal** to avoid future duplication in projects proposed.

Test programs had been workable but not wholly satisfactory. Major flaw was placement of production responsibility of guided missile under administrative control of the Morrison Bond Army group. He felt that a separate office should have been established. It has felt that there were a complement of control carried by USAF and Navy in decision issued by Atomic Committee of Morrison Bond.

The Office of Guided Missiles, now set up, relying on strong organizational makeup of existing control agencies, will not completely cancel Army growth. The project will be supported by the services, with the major part of a service "see partner" such as K. T. Keller in the new agency director. Specially, successor of Maj. Gen. Nichols will modify the Army.

An engineer of the Manhattan Project, Nichols supervised activities of some 135,000 persons, including research, engineering, construction, and operational personnel, 22 university centers, research and development in connection with design, construction and development of all plants required for the production of plutonium and enriched U-235, and construction of Oak Ridge, Tenn., and Richland, Wash.

From his proposed assignment,

Nichols has been chief of the Armed Forces Special Weapons Project, and senior member of the Military Liaison Committee to the Atomic Energy Commission.

Greatly detested, so far, to developing a missile weapon has been lack of coordination on complete interchange of technical information between services. A missile of one service may have a guidance system entirely copied by another service to perfect its missile development. The guidance system in existence, and in use by one service, could be lost by accident by contractual arrangement between industry and service.

The guided missile office will have as great purpose coordination of research and the programming of progress of several missile developments. It will foster interchange of technique, methods, design and engineering of one missile with that of another—on several other—its develop a single missile program.

For example, the guided missile Materiel assembly tested by Air Force at Hurler's AFB, is combined with Nichols' Regulus. Carriers program of still another Army missile of similar program

may be added to Matrodor-Regulus, and the ultimate combined design a ready for production and test by all three services.

• **Guidance Control Problem**—Problem of remote production being the new major agency set staggering. Among these are aerodynamics, powerplants, fuels and combustion, theoretical mechanics, chemistry and physics, metallurgy, electronics, electronics, ballistics, vehicles and launch, and many others, representing nearly every field of the nation's technical knowledge.

Most troublesome at present are the guidance systems. Generally speaking, there are two types of guidance—those relying on the use of electronics and those that do not. • **Non-Electronic**—Those not relying on electronic guidance are less susceptible to enemy countermeasures. Conversely, they are the most complex from point of view of control. One has not even developed in this type of guidance is the missile guidance groups, aimed the inertial system.

A second non-electronic guidance method is automatic star tracking by means of a telescope device with the

control mechanism. Paired to follow celestial stars (such as in the case known as ship navigators at sea) this is called the inertial system.

Coordination of the two systems is in advanced development, with guidance provided by the inertial system, and electronic—most advanced method of guidance is that of radio system. First guidance systems will undoubtedly depend primarily upon this system. These systems include passive, semi-active, and active homing. Other electronic systems in final stages of development are the beam rider system, and two-beam optical guidance system.

• **Weapons System**—Another concern of the Office of Guided Missiles is coordination of the weapon systems. For example, sub-sonic guided missiles could be of little use if not carefully coordinated with the inertial development and production of radio intercept sets, radio-jamming and jamming for utilization. Weapons systems, however, will stress under primary control of individual services.

Early losses in to standardization of missiles, launching sites, training pro-



## Martin Prototype 4-0-4 Takes the Air

Prototype of the new Glenn L. Martin 4-0-4 transport is flying at Baltimore, while the Martin company poses along with other transport manufacturers for defense aerial program to get its 4-0-4 production line rolling.

Delivery schedule call for the first production 4-0-4 to be ready early next spring, with total orders for 75 planes—40 for TWA and 35 for Eastern Airlines—now booked. In addition Martin is discussing the possibility of additional sales to other airlines, and has a military transport version of the 4-0-4 under con-

sideration by both the Air Force and the Navy.

The prototype 4-0-4 is the company's largest 2-1-2 twin plane modified to the new 4-0-4 configuration, with addition of 39 ft. in fuselage length. It will be used for all the CAA certification tests except those involving cabin pressurization.

Modification of the test ship to include a pressurized cabin would have required a major reconstruction job on the fuselage; in the Martin program performed in west and east the CAA

certification tests on the first of the production 4-0-4s which may be flying about the first of the year.

The new 40 passenger transport will have a gross takeoff weight of 42,750 lb., including 18,275 lb. payload.

Powerplants are two Pratt & Whitney R-2800 CB-16 cylinders of 2400 hp each, having three blade Hamilton Standard propellers. The plane is designed to cruise at 268 mph at 18,000 ft., with a top speed of 312 mph at 14,000 ft. and with 79 mph still speed at sea level.

sonal and maintenance techniques applied to mid fractions of the weapons system to be conducted by Office of General Motors.

► **Fresh Allocations**—Most important to the industry, perhaps, is that the Office of General Motors will provide financing assistance for the allocation of funds for research and development, and specifically for production.

At the time of acquisition of the Harrier Stuart report (Aviation Week, page 24), there were 17 qualified manufacturers in various stages of development. Army supported seven major projects for an estimated cost of \$16 million. Nine 15 variant projects at a cost upwards of \$75 million, and Air Force was spending an estimated \$18 million in 11 contracts.

House Defense Secretary Johnson cited the Stuart report as a rate of funds transfer, subsequently induced cutbacks across the board. Several projects were shelved or moved down to the development of planned "late time" for development to survive the step.

Currently, development to seven contract awards was made to Boeing's CAPS, Martin's Predator (Boeing) MX 504, General Electric's Hercules scout, Tim Stahl's Lark, and Douglas' Wic by late 1973.

Conflicts caused by former Secretary Johnson, accompanied by events led up to Korea, have postponed even that loosely timetable.

Now the office of General Mueller is to meet to allocate production timetables, will satisfy successful contractors such as the Lark and Predator scheduled for delivery and service use by mid-1975.

## Army Copter Groups Get H-19 Transports

Slightly 80-90 are the first production jobs to go into the new Army transport helicopter program, systems researchers last week. (Aviation) H-19 is the first of three new transport helicopter configurations with 21 of the larger six-chairs to each are scheduled in Army orders for 1972 expenditures. A few additional H-19s will come in under available stock companies will be equipped with two hybrid rotorcraft helicopters—primarily the Bell UH-1H which has also been ordered by the Army. That will be used for command and communications roles.

Since the number of Bell allocated to the week by three companies is only a small fraction of men, they 50 scheduled for 1972 purchase it is probable that the others will be used for transport and liaison, staff transport, and utility work.

Washington sources say that the tandem rotor Bozelli H-21 never left

copies a not expected to figure in the initial Army transport helicopter program, but will probably be in the 1973 program, when additional Sikorsky 11-9s are expected to be added.

► **800 Needed**—Announcement of the program conference (Aviation Week, Oct. 9 report) that Army helicopters was being placed an assault transport helicopter. An Army spokesman says the Army limited transport helicopters will be used in large, diverse and smaller tactical units. With the extended Army organization calling for 35 to 200 units, he would issue orders for approximately 800 of the big transport Sikorsky and Bozelli to meet a requirement of one company to a division.

An Army spokesman said that speed and flexibility were expected to be used in large, diverse and smaller tactical units. With the extended Army organization calling for 35 to 200 units, he would issue orders for approximately 800 of the big transport Sikorsky and Bozelli to meet a requirement of one company to a division.

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**WRIGHT WINNER**

Cover Looking has been awarded the Wright Brothers Memorial Trophy for "significant public service of enduring value to aviation in the U. S." The trophy, which is administered by the National Aeronautics Assn., will be presented at the annual dinner of the Aero Club of Washington on Dec. 16. Looking, chief engineer of the Wright Brothers airplane company, helped develop the first successful airplane, and since 1945 has been committed to the National Advisory Committee for Aeronautics

vehicle, such as 14-ton trucks and some flows in other single units.

Part of Army's research and development funds have been earmarked for improvement of rotary-wing aircraft and other aircraft with similar characteristics," assuming congressional (Aviation Week, Aug. 28), and very low flying, dual wing aircraft, it was announced.

## Industry DOs?

Washington is studying priorities for transport plane manufacturers.

By Alexander McBeathy

The serious problem of threatened shortages in transport airplane production last week, was getting top-level government attention in Washington. That situation will face a satisfactory priority solution.

"There seems no alternative to a priority stamp for production of transport planes, and parts and personnel," says one source. The industry's Washington representative explained it. "If we don't get this, it will be just too bad."

Such top-level interest was John McConn, USAF Undersecretary, Dept. W Research, CAB Chairman, and Robert J. Smith, deputy chairman of National Security Resources Board, joined with Adm. DeWitt C. Ransom, president of Aircraft Industries Assn., and Adm. Bruce S. Lord, president of Air Force Joint Staff, in studying the problem last week under the auspices of the Air-Industry Council.

But the main purpose of their efforts was to explore the more tactical road to a man who could do something about it. It is a "Warrior" (Aviation) Hart, was chief of the National Production Authority.

► **Source: Not Critical**—Visible in Aviation Week circles, with some reserved optimism, manufacturers and pilots indicated that the problem of spare parts could become, but was not yet critical.

Here is what the problem amounts to: Airplane manufacturers and airline executives contend they should have DOs (Defense Orders) issued in order to insure a continued flow production of the transport planes on order by both the airlines and the military service. Not only the airlines themselves but pilots to help them in operation are required.

At least one airline has indicated that

when additional spares are released within three weeks it may have to cancel some equipment.

The entire problem is not confined to domestic operation of American transport. The larger airlines, most of which are mostly American-built plants, are up against the military. Some of these findings serving the State Dept.'s help in the problem.

"The airline planes are so much a part of the military effort to air that we cannot let the airlines have got, and they are used that way wherever the services were there," said Adm. Lord at AFA. "We wish the only form of aviation transportation called into service in the Korean peninsula. So we get a fair look on some DOs, that's all we want."

Principal transport plane manufacturers with certain plane contracts yet to be filled are Douglas, Lockheed and Martin. In addition, both Boeing and Boeing have numerous previous planes now in airline service, which will require spare parts replacements for up to 10 years.

Also affected will be engine manufacturers such as Pratt & Whitney and Wright, and propeller companies such as Curtiss-Wright and Hamilton Standard, also have a large inventory on export inventory—propeller blades.

► **Vital Defense Role**—American, operating for his AIA manufacturing interests, pointedly indicated that in view of the vital defense role performed by the airlines, their orders for transport equipment and spare parts "certainly will receive equal consideration and priority to that allocated for military."

The National Production Authority has already started a program to assure continued production of needed freight cars, Adm. Ransom pointed out.

Current airline orders now stand at a total of 161 new and replacement transports, the highest transport plane backlog in over 20 years, an AIA survey shows. Unless a priority system is provided to make those plane deliveries possible, the airlines and the military problem seem to be almost identical. The airlines will be almost identical the airlines' interests.

Meanwhile yet another military service problem is what it is about military transport planes, where the airlines is making some plans for take-over orders and others of the same type for airlines use. It can be got material for all at once, the military and airline executives will see the benefits of lower cost. But if he has to cut off his airline orders, it will mean up his costs, and disorganize his production line.

An Air Force spokesman had said that it would not be necessary to have the best of aircraft industry plans due to interfere with plane production for commercial airlines. This statement

## Flight Safety Foundation Makes Awards

Unsettled recognition has been awarded the safety contributions of seven pilots in two of the five awards of the Flight Safety Foundation. Citation of capture and crew of American Airlines and British European Airways was one of the few recent occasions airline pilots have been honored for achievement in the extreme performance of their duties, rather than for special engineering or research work.

FAF plaque, presented this year at the organization's Safety Seminar being held this week at Denver, Colo., was awarded to:

► **Capt. Robert C. Eber** and crew of American Airlines Flight 14 on Aug. 31, 1970, for diverting the highest degree of professional skill in landing the plane after engine failure of a propeller and engine had failed the government and airline pilots, which were. Plans have generated the year by J. A. Hedley, vice president of American Airlines.

► **Capt. Ben R. Hovus** for flight 14 on Aug. 12, 1970, when a bomb exploded in the rear of his BSA Boeing transport, diverting the landing and control actions. With assistance of his crew, Hovus landed the plane safely.

was taken as an indication that Aviation would give increased performance to the transport industry such as pilots and parts for the airline and a similar attitude not expected from the Navy.

Mis problems seemed to be to get the production authority such as stated for the airlines DOs. It was reported that the production authority did not have any particular basis or criteria yet set up to handle aviation equipment priority. It is said that probably the main reason for the lack of action as the subject up until the meeting of the Air Coordinating Committee group with Mr. Hovus.

## Enright Quits NAA In Split on Policy

The National Aeronautics Assn., attacked about former policy, has been sharply criticized of the split in its mails by the organization from its board of directors of William R. Enright, for more than 25 years as NAA's most active leader.

Enright said, he said in a letter to the board, because NAA plans to continue a "structural pattern... that has been

► **The Professional Aeronautics Commission** and its executive director for "outstanding contributions to the safety of the flight." Through education, safe enhancement of regulations and through resident investigators, the commission "shows what the state can do to improve the work of the federal government," the citation says.

► **Carroll Popper**, director of Carlin Wright Corp. for development of the retractable propeller nose-wheel configuration, in the area of prime importance in furthering the safe operation of aircraft. "Hazel" Horn Standard division of United Aircraft Corp. shared in this tribute for its later development work on the retractable aircraft prop.

The awards are presented annually by Aviation Week, 1971 designates the government and airline pilots, which were. Plans have generated the year by J. A. Hedley, vice president of American Airlines. He will be back to the 1970 Safety Seminar dinner meeting at Denver's Hotel Commodore during the closing of Oct. 31.

► **Enright's resignation** was announced by the board of NAA, a primary program on local community activities, and a similar attitude not expected from the Navy.

Enright, president and chairman of the board of NAA, is immediate past president of FAA and formerly FAI president of NAA. He has several times proposed that NAA remove its organizational structure into several areas: some outside one of which would be for community activities, another for FAA work.

Enright has long been a supporter of FAA, although the organization does much of its writing from the fact that it was the official representative of a recognized world body in such matters as aviation records and private aviation.

FAI has become increasingly distant from NAA's handling of its affairs in the past and the current FAI executive, Boris Anouyev, of the Soviet Union, has recently stated that NAA needs to be reorganized if it is to continue to be the FAI representative in the U. S.



## Congressional Roundup

► **New Commissions**—Washington expects Secretary of Defense Gen. George Marshall's resignation before 1951 has progressed far.

Billed in Marshall's absence is able Under Secretary of Defense Robert Lovett, with a long record as a friend of aviation. An former Under Secretary of State and former Assistant Secretary of War for Air, Lovett is now titled in Washington as "always a lieutenant, never a boss."

Marshall has accomplished his main mission. He's smoothed out the bitterness and backbiting between the State and Defense Departments that reared under the administration of Louis Johnson.

► **Admin. Tosses Stinson**—may succeed Gen. Oscar Bradlee as chairman of the Joint Chiefs of Staff before next month. The Navy is hoping as Congress extends the chairmanship to rotate.

► **Less Uncertainty?**—Spoke-casting, Rep. Carl Vinton, powerful chairman of the House Armed Services Committee, demands a halt to uncertainty.

Since the Kansas war cost a lot and over Louis Johnson's days in office a dollar here or there by cutting fat or more from the military budget, the speaker is clearly in favor of analyzing and knocking economy and generally doing things together his stated Vinton's dedication may start a trend in the other direction—against economy.

Army, Navy, and Air Force agencies, he points out, are being told to "do more with less" and to "do it as little possible business entity in the U. S. It's an agent empowering a civilian Secretary of Defense, with a few miles' far-flung contact with the civilian military staff, actually to rule over the professionals with lifetime experience in their service. He means the post referred to "coordinate" others. The three senior secretaries, dominated by their chiefs of staff, would have autonomy over their departments.

"I want the Defense Secretary job turned down to people who would still serve their training down," Vinton continues.

If it is, extensive conflicts will be abetted by Vinton's House committee, which he rules with an iron hand.

► **545 Billions for Defense?**—Supplementals for national defense, totaling \$13 to \$15 billion, will be recommended and probably approved by Congress, before the 1951 fiscal year is out. This will be in addition to the \$30 billion already appropriated for the current year and foreign military assistance. The most unusual change is on the North Atlantic defense program. The military center of the 12 North Atlantic Pact countries—comprised of chiefs of all non-voting-worshiping that out last week in Washington. The program will have to be funded by each participating country. This makes it doubtful that they will be as supplemenation before spring.

"This is the outlook now on additional defense spending."

► **Electricity Equipment**—Several bills have already been drafted for submission to Congress late in November. Much of it will go into the emergency relief program program. But both Air Force and Navy are studied down for substantial funds for electricity equipment for conventional aircraft.

► **Expenses Act**—It said when the North Atlantic program is worked out, it will save \$300 million to \$1 billion in new plane procurement for U. S. manufacturers. But

the bulk of European-based craft under the program will be produced in Europe. Instead, the U. S. and British manufacturers will be called on to supply virtually all of the jet-turbine engines.

► **Am. Force**—There will be no additional funds for new plane procurement in the 1951 fiscal year. But additional funds will be required to offset price rises and meet the program for 4428 new planes that are to be built up to a 53 group (over by the end of 1951). This will total \$400 to \$500 million more.

► **New Act**—A modest buildup over capacity planned through for the year in the wind—but not yet approved by the Joint Chiefs of Staff. However, the program for procurement of 557 planes that year is given by a few national or one large stock market. But House Armed Services Committee's Veterans, after possible office conferences with Chief of Naval Operations Sherman, has come out in a building to a 120-acre base this year. The would cost procurement of about 300 more planes.

► **Messie Architects**—Joint Chiefs of Staff will move without hold up to 15 squadrons—about 350 aircraft. Now programmed for the year 12 squadrons. But Ray Vinton, with the unanimous backing of his Armed Services Committee, plans an outright hike to 24 squadrons in 1951. This would mean 770 Messie aircraft—about 335 more than the Corps now has. It will be a hot battle.

### What to Watch For

► **Tactical Air Showdown**—Air Force and Army will battle in open for control of tactical aviation as public hearing before the House Armed Services Committee, possibly shortly after Congress recesses in late November. But the committee's chairman, Rep. Vinton, has already decided where tactical aviation is going to be—with USAF.

► **"Modernized" Corsair**—Navy will get the green light from Congress—on costs it also—to move forward with its new "modernized" F4U Corsair. Navy has also done its "paper" work. United States—dubbed "The Fighting Dog"—designed for long-range bombers. It was the Navy's bid for USAF's role of strategic bombing. Its new carrier will be designed for smaller instead of aircraft and maximum mobility.

► **Electronic Center**—USAF will start moving equipment to its new electronics center at the new facility, Office of AF, West, N. Y. late in November. It is being moved from Wright Field, Watson Laboratories at Dayton, Ohio, N. Y. and Cambridge Field Station, near Boston.

► **International Air Traffic**—Netherlands' United States programally legalizes transit during its some session this winter, that is in the books.

The Commerce Control Act is letting U. S. international air carriers from both sides.

Under its previous agreement, or even that, any visit to its country, of any European who at any time in his life has been associated with a totalitarian government. State Dept. is drastically cutting down European-U. S. air travelers by refusing them to be virtually all British and substantial segment of the population of most other European countries.

But the statute also makes anyone subject to a fine of \$1000, plus responsibility for transportation back home, plus equities while in the country, of any European who might be designated as undesirable up to five years after.

## PRODUCTION

### NAA Wage Pact

New agreement insures against work stoppages for next three years.

North American Aviation Inc. has just bought some "insurance" against work stoppages for the next three years by signing a contract for that period covering 11,178 of its employees in the DAW-CO program, one for the Los Angeles, Long Beach and Downey plants. North American paid approximately \$1,875,000.

Believed to be the first long-term labor contract for a major airplane manufacturer, the new agreement provides for:

- Nine years on base annual pay increase.
- Additional five cents an hour for certain skilled job classifications.
- A "check-off" agreement which will serve as a wage base for the life of the contract.
- Increased insurance benefits with no cost to the company.

### Air Force Bid Invitations

Bid openings are 20-30 days after opening date. Make bids in the following bid openings. Bid dates are subject to change. For stress to be placed will be sent to qualified applicants who state bid invitation number.

One bid will be available for competitive bidding, without selection by prospective bidders, after bid invitation date, at each of the seven AFMS procurement field offices. The multiple items to be specifications before writing or telegraphing for them see bid list.

Procurement field office locations: Boston Army Base, Boston 33, Mass.; Government Aircraft Plant No. 4, Ft. Worth, Tex.; 19 S. LaBelle St., Chicago, Wright-Patterson AFB, Dayton, Ohio; WPA, Warren and Langley AFB, Detroit 31, Mich.; WPA, Washington Blvd., Los Angeles 43, Calif.; N. Y. 4.

### INVESTMENTS

► **Investment**—1,119 items bid invitation No. 10-2701, issue date 12 Oct., delivery 100 days after date of award.

► **Investment**—1,119 items bid invitation No. 10-2702, issue date 12 Oct., delivery 100 days after date of award.

► **Investment**—1,119 items bid invitation No. 10-2703, issue date 12 Oct., delivery 100 days after date of award.

additional cost to company employees.

- Stronger union security clause providing for a modified union shop.

The contract contains a pledge of no strikes and includes a provision that all contract terms are settled until Oct. 22, 1953, except that wage rates will be open for renegotiation, once after 18 months.

Discussion will be opened soon with other workers at the Curtiss-Wright American employees. AFL, Teamsters, United Workers of America, and Police & Firemen's Benefit Assn.

Widely and untaxed employees at North American will receive a pay increase similar to that accorded the union members effective Oct. 21, and provisions for cost of living advances and increased insurance benefits are also included for the program.

Five contracts altogether will boost North American's payroll approximately \$4 million on an annual basis.

J. H. Kunkelberg, North American business administrator, says the agreement "A great contribution to national security and a strong, stabilizing influence in the field of conventional transport."

within 48 days, completed in 24 days thereafter.

### DC-6 Orders Hit \$100 Million

Shipyards increased orders for DC-6 aircraft program to keep Douglas Aircraft's South American production line rolling along at a good rate for the next couple of years—that is greatly boosted military commitments have enhanced the picture at the company's Los Angeles and St. Louis plants.

The company's manufacturing of conventional plane backlog has control in 91 plants valued at about \$100 million, with 68 of the orders coming in during the past 30 days. Company spokesman says that its backlog exceeds DC-6 production into the year at summer of 1952.

Douglas' various production lines are all well on their way to 1952 at least in different stages of completion.

Stinson Messie will handle the DC-6, DC-6A, DC-6B, B4D-1 (Navy DC-6A) and B-50-B (Navy's Super DC-7).

► **Long Beach** is targeted on the C-119A Glancaster. It will handle the C-119A, a new version of B-36 Invader, the new B-47 advanced.

► **El Segundo** will be busy on the AD Skyrocket, F3D Skyraider and AD Skyraider.

► **Rockledge** boosted—The first six months of the year gave the company sales of nearly \$100 million. Building was finished in the last three months of this period to 1951, with 1952 orders for \$278,546,000.

► **Company** working capital was up to \$55,858,414, with net worth (increased to \$23,696 per share. Present total employment for the three plants is 22,716.

### PRODUCTION BRIEFING

► **Lockheed Aircraft Services**, Burbank, will manufacture and modify 2000 aircraft of Boeing C-47s under USAF contract.

► **Boeing Aircraft Co.** has increased employment at its Seattle plants by about 2000 since the start of the Korean conflict. Employment now is over the 30,000 mark. Wichita division employees have increased by 1000 in cost of new aircraft. The company's engineering division saw total slightly over 1300 persons, and approximately 1300 more will be added to the Seattle plants before the end of 1951's first quarter. About 500 mechanics will be put on at Wichita during the same period.

# Northrop Scorpion Assembly Lines Roll



Production of the two-center all-weather F-10 Scorpion is well under way by Northrop Aircraft at Hawthorne, Calif. An undocked but complete fuselage has been selected by the USAF.

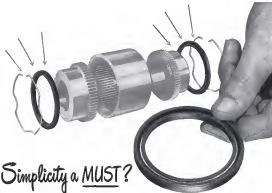
The pictures at left and below are the first to be released showing how the company has set up its production line.

Top photo depicts how the Scorpion's fuselage is built in halves, with formers arranged to provide ample working space. Cabins and ribs in the center line necessary parts and tools within easy reach. Air and electrical connections are built into the formers.

After the fuselage halves are completed, they are lifted from the jigs by cranes and moved to the rest of the area to be fitted with plumbing, wiring and other equipment. Center line formers are arranged to provide ample working space. Cabins and ribs in the center line necessary parts and tools within easy reach. Air and electrical connections are built into the formers.



The picture below shows part of the final assembly procedure. Those wings, with landing gear, have been attached. Finaling services in the pre-plant area have moved across the top of the plant and down, picking up wings and tail. The secret on pre-assembly of such equipment greatly reduces final assembly time since only a few items remain at the same time in the heavily crowded area.



## Simplicity a MUST?

... use the oil seal that's designed to save space!



### Only 2 simple parts!

The Johns-Manville Clipper Seal consists of only two parts—a one-piece, non-toxic molded lip and a specially designed power spring. Individually assembled into a single, compact unit. Available in both split and carbon split.

This exploded view of the revolutionary, new Split-Ring Gear Coupling shows how Clipper Seals helped one engineering manufacturer achieve simplicity and compactness in the design of his product.

The result is a thoroughly streamlined gear coupling—composed of a few simple parts—that is so simple that it can be taken apart—and reassembled—in a few moments.

Clipper Seal's simple design provided important space-saving advantages that helped make this particular Seal of a unique design available were used to permit making the oil seal cavity of maximum depth. Com-

posed of a rigid heel and a flexible lip molded in a single unit, each seal does an efficient job of retaining oil and excluding dirt, moisture and corrosive fumes—and does this job in a minimum of space.

If you are looking for an oil seal that will help streamline your product, it will pay you to investigate Clipper Seal's many advantages. They are available in various lip designs to provide a choice of bearing surfaces, in sizes to fit shaft diameters from 1/2" up to 60" and for temperatures up to 450 F. Just write Johns-Manville, Box 358, New York 16, N. Y. Ask for brochure PK-66A.



## Johns-Manville CLIPPER SEALS



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It's not surprising that Bedford Airport is patronized heavily by private flyers, cargo carriers, military units and research flying. Nor is it surprising that such an airport provides an environment with top quality Cities Service aviation products and services... exclusively. For throughout the nation you'll see more and more sleek, well-manned airports displaying the bright, familiar green and white sign of Cities Service.

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Complete location—complete C.A.A. authorized maintenance—control tower, radio and night lighting facilities (24 hrs.), including coastal-directional beacon system and flashing air beacons—three T1007 runways—flying school—charter service—restaurants—and only 20 minutes to downtown Boston by bus or "Green Line" subway.

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Cities Service Aero Oils

Cities Service Clean Solvent Engine Cleaner  
Cities Service Aero Greases and  
Aviation Specialty Lubricants



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## AERONAUTICAL ENGINEERING



SINGLE ROTATION turbopropeller



DUAL ROTATION turbopropeller



SINGLE ROTATION propeller

## New Props for Turbine Power

Series developed by Curtiss-Wright specifically designed for turboprop service in subsonic, transonic, supersonic ranges.

### By Irving Stone

In one rapid sweep, aerodynamic air-gas progressions took us from turbopropeller power to the turboprop. But a period of engineering, reflection and technical contribution has given us a stable general development: the turboprop—in which the propeller is playing a major role.

Though the turbine propeller speed

potential is below that of the jet, a turbopropeller offers a reasonable value at the present-day aircraft speed spectrum coupled with better bleedoff and increased range. And propeller shortcomings feel that propeller efficiency can be higher than that of the pure jet even into the supersonic region.

► **Advantages.** Needed—Wide aerodynamic requirements for turboprop engine propellers are generally similar

to those on piston powerplants. The higher power of the turbopropeller has necessitated blade refinements in pitch distribution, section thickness, axial sections and planform.

And as in piston engines, specific propeller types are indicated for individual turboprop applications and for different types of aircraft engines. That, diameter will vary, angle and draft rotation will be required, and one

designer will be adapted to fit the varying requirements of the subsonic, transonic and supersonic speed ranges. ► **Low Pitch—**Where the forward speed of the plane is low, the subsonic prop is adequate and gives high efficiency. But as the forward speed of the plane is increased, the design rotational speed of the subsonic prop has to be decreased to hold a tip speed of about Mach 1 to keep drag losses down, resulting in high induced losses.

In the supersonic propeller, the design rotational speed is increased at high airplane speed to lower induced losses. To reduce profile drag losses, the blade is made very thin along its entire length. In position, a large portion of the exposed blade will be operating at supersonic speed even though the aircraft may be operating above or below that speed.

### Single-Rotation Models

(Subsonic)

Model	Class Bucker		Four Bucker	
	Citation	Quest	Citation	Quest
Model	40-100	70-100	40-100	70-100
Max. dia.	48-1/2	74-1/2	48-1/2	74-1/2
Max. tip speed (ft./min.)	200-200	300-300	200-200	300-300
Weight range (lb.)	100-100	150-150	100-100	150-150
Power range (hp.)	100-100	150-150	100-100	150-150

### Dual-Rotation Models

(Subsonic or Transonic)

Model	Six Blade		Eight Blade	
	Citation A	Citation B	Citation A	Citation B
Model	40-100	70-100	40-100	70-100
Max. dia.	48-1/2	74-1/2	48-1/2	74-1/2
Max. tip speed (ft./min.)	200-200	300-300	200-200	300-300
Weight range (lb.)	100-100	150-150	100-100	150-150
Power range (hp.)	100-100	150-150	100-100	150-150

► **New Prop Series—Antejetting**—The wide use of turboprop engines as auxiliary and commercial units, the Project design of Curtiss-Wright Corp. has concentrated its research and development on prop designs especially intended to harness gas turbine power in those regions of light-to-medium, moderate air velocities.

Known as the "Echelon" series, 16 of these props and associated control assemblies will be in use with the considerably higher power of the turboprop—out to 20,000 hp—and an initial one-year and one thereafter required.

► **Stator**—While from a strict service point-of-view, the new series of props might still be considered developmental projects, Curtiss-Wright technicians state that the subsonic and transonic tests are mostly for experimental use at the stage of subsonic.

They say first for any considerable installations to get fully, the blades for such props are likely to go into production, that the problem is usually one of adaptation to specific turboprop designs.

For the supersonic prop, a period of actual developmental proving will be required.

The engine-out design steel hub and the electro-mechanical pitch-changing mechanism, similar to that on production propellers used on the B-36, are already service proven.

► **Steel Midprop**—Blade material for the supersonic prop, says C.W., at least in the present stage of actual development, necessarily will be steel because of the structural properties acquired.

For props in the subsonic and transonic class, where diameters exceed 13-15 ft., the material also must be steel, C.W. feels, because solid aluminum alloy blades at this larger size are heavier for adequate strength.

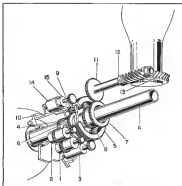
Use of steel permits a hollow blade, to give a low weight-to-strength ratio.

The supersonic blade might or might not be hollow, depending on propeller diameter.

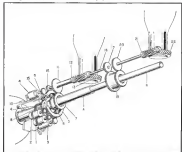
► **Distortion, Thickness**—Distortion of the subsonic and transonic props generally are equivalent to those of any vertical propeller. The supersonic prop would necessarily be stiffer because of the higher rotational speed, for the same material.

In the subsonic category, up shock ratio (thickness/width) will be about 5 percent, in the transonic series, about 3-4 percent, and in the supersonic area, thickness ratio will be six to sevenfold less.

► **Blade Configuration**—Blade planform is naturally rectangular, with high blade activity factor and total solidity designed to efficiently absorb the large power of the turboprop. And the blade's square end will ease fabrication



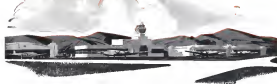
Subsonic airfoil pitch change scheme: 1, increase pitch stroke; 2, decrease stroke; 3, fixed pitch blade; 4, poppet shaft; 5, movable air gap; 6, pop shaft; 7, pitch change air gap; 8, pitch change piston; 9, reaction piston; 10, fixed air gap; 11, pitch change piston; 12, blade vane; 13, blade gap; 14, sleeve; 15, sleeve nut; 16, poppet shaft.



Dual airfoil pitch change mechanism details 1 to 15 (shown in those shows for single section prop scheme shown) 16, 17, outboard piston; 18, outboard piston gap; 19, outboard pitch change air gap; 20, outboard pitch change piston; 21, 22, outboard blade vane; 23, outboard blade gap; 24, outboard pop shaft; 25, outboard shaft.



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problems. C-W may therefore see no increase in cost involved in using that spaced tip shape instead of the clip face on round tip, since no difference in efficiency in these shapes has been found within the accuracy of testing. Blade stresses are the low-drag NACA 16- or 6-series. Design left no discounts (canceler) on selected tip geometry performance in several cases with installation requirements.

► **Ranges between**—The accompanying chart of single and dual rotation advance shows how the two-blade propeller might fit the common speed regimes.

The single rotation, advance unit would be applicable for engine Mach numbers up to approximately 0.8.

The advance, dual rotation prop actually would be a high advance and low efficiency unit with a stage up to about M 0.55. (The dual rotation prop gives a slightly higher efficiency, but involves more weight.)

The transition area, encompassing speeds to about M 0.9, she would have dual rotation.

And for operations from about M 0.8 into the supersonic regime, the single rotation device again would take over.

However, as a first approximation, single rotation probably will be used in subsonic applications and dual in the supersonic one, although the use probably will be qualified, depending on specific problems. Thus, a flying boat might use dual rotation, smaller prop for adequate water clearance.

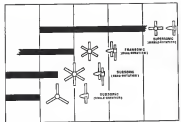
► **Efficiency**—Charles C-W says that flight test wind tunnel tests show that flight efficiencies of the advance and two-stage props are at substantially high levels—80-90 percent at cruising speeds, and 80 percent at speeds up to 500-600 mph.

The supersonic prop, they say, will maintain equivalent high-speed efficiency into the supersonic region.

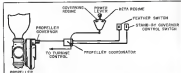
► **Blade performance** is expected to be at relatively high values—4 to 1.3 static thrust per horsepower, depending on propeller type, altitude requirements, and relative position of after operating conditions.

► **Pitch change coordination** for the advance and two-stage propellers for single and dual rotation are down to accompanying slat. Pitch change mechanism for supersonic applications will involve the same principles, but probably will require detail design differences.

► **Single Rotation Pitch Change**—Pitch change is accomplished by power taken directly from the rotation of the propeller shaft. Electrically actuated mechanical clutches transmit the power to a differential roller gear system located between the stationary housing on the engine case and the blades. Two electrically actuated pitch ac-



SPEED SPECTRUM for C-W's new propeller units for developing powered planes



BLADE ANGLE control system schematic for new propeller units

tion devices are used during normal flight operation, one for retract (1) and one for deice (2). When a control signal activates one of these slatlets, it also energizes the lead patch bolt (3). Going from the propeller shaft (4) is then coupled through the retract slatlet and the propeller movable ring gear (5) to the advancing assembly. This assembly enables energy to be transmitted from the stationary pitch changing mechanism to the rotating hub.

During fixed pitch, the blade (6) is engaged and both propeller shaft and gear (5) and pitch change gear (7) rotate with the propeller shaft or hub. Two bearing planet gears (8 and 9) meshed with the fixed ring gear (10) and the movable ring gear (5), which is then stationary.

When power is transmitted, clutch actuates to the movable ring gear (5), it rotates in relation to the fixed ring gear (10). This change of relationship, which through planet gears (8 and 9), causes the movable pitch change gear (7) to rotate in relation to the hub

See gear (7) is coupled to the blade gear (5) through the power gear (11) and worm gear (12). Upon completion of the retract signal the clutch disengages, and the leader (3) engages to maintain the adjusted blade pitch.

To provide necessary power for slow two pitch change operations at low rotational propeller speeds, an electric motor (14) is used for completion of the feathering cycle, retraction of feathering, and for advancing pitch to the starting angle as well as to that for the after static operation.

When power is supplied to the feather motor, which is normally disengaged from the power by electric motor clutch (15), the clutch couples the motor to the movable ring gear (5). The electric brake (16) is actuated when power is supplied to either the clutch or the electric feather motor.

► **Dual Rotation Change**—Pitch change mechanism for dual rotation props is essentially the same as that for a single rotation unit, except for the added gear required to operate the retract slatlet. This gearing is similar to that

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need to increase the pitch change power from the stationary bearing to the rotating subblade hub, except that the gearing is a partial differential and must occur through the inboard hub, which is turning in the opposite direction.

Referring to the first station gearing (pitch), the cardboard planet gears (16-17) are mounted on shaft (15), operating through the pinion and worm gear assemblies (11-12) in the subblade hub. Rotation of the movable ring gear (5) is transmitted through these planet gears (16-17) to the inboard pitch change gear (19) coupled to the outboard blade gear (22) through pinion gear (20) and worm gear (21). Sets of planet gears (16-17) have been selected to hold the outboard pitch change on gear (19) stationary with respect to the outboard hub upon completion of the control signal.

Blade angles and rates of pitch change of the inboard and outboard propellers can be selected to equilibrate the torque loading between the propellers as required by the particular installation.

Control hardware consists of a propeller-mounted governor and a controller, designed to operate in conjunction with the specific power control system of the turboprop. The C/W control system for engine-propeller combinations presently being developed is divided into two operational phases:

- The governing regime is utilized to provide constant-speed operation during takeoff and all flight conditions. Co-ordination of turbine power and propeller blade angle is automatically controlled by the propeller and power controller.

- The beta regime (blade angle follow up) is utilized for all ground handling operations, including reverse thrust. Turbine power and propeller blade angle settings follow the position of the power control lever in accordance with a scheduled relationship.

- Governing—Operation of the control lever, within the governing regime, changes the settings of both the propeller governor and the turbine control as scheduled by the propeller and power control controller. The governor is mounted on the aftside of the propeller mechanism and is connected to pilot's control lever through the propeller controller, as shown in the accompanying control schematic.

The governing system solves difficult gear, mechanically compares the engine gas flow of a stationary speed source and produces a pitch change signal to correct any existing error. Acceleration sensitive feedback is provided to give best performance and stability. The blade-angle-related signal from the governor is transmitted to the propeller pitch change mechanism where it is compared mechanically to the control blade angle. Output of this

mechanism controls the operation of the pitch change mechanism.

The release power source is a synchronous motor controlled by a variable frequency power supply in the prop controller. When used on constant regime aircraft, the power supply can be used to furnish a constant reference speed for all engines to obtain synchronous constant speed operational conditions.

The electrical speed reference is supplemented by a standby, flyweight governor which detects any underload of the synchronous motor system and automatically increases control as the reference speed source is both out of phase and out of speed.

Separate switch is provided for manually setting the flyweight governor in the event an speed change is desired during steady governor operation.

- Follow-Up—Motion of the power lever in the beta regime (blade angle follow up) operates a potentiometer in the propeller controller. Output of this potentiometer is compared to the output of one of the blade pitch sensors in the propeller, and the voltage difference is utilized to signal the inboard blade angle change.

Following is controlled by an in-flight switch, controls over pilot's control line. Operation of this switch overrides all other controls and increases the inboard pitch change directly.

C/W says that at control regime needs change due to further takeoff and aircraft development, the present control system can be modified to provide for such features as constant speed in reverse, additional blade angle steps, etc., with an extended change to the nature's logic circuitry.

- Engine Prop. Control—A complete control line coordinated control of both constant speed engine rpm by fuel flow regulation and turbine power by blade angle control also is under development at C/W.

- Approval—For installations in which the component set is adhered onto center drive shaft the prop. drive, NACA type D and E near 10 inch diameter could be used.

The type D governor is lighter, simpler in design than the type E. Its control is via frequency, it probably would be suitable for installations where an older engine inventory of approximately 90 percent is acceptable. The type E governor will provide greater air/turbine power recovery—approximately 93-95 percent.

- Ice Protection—Installation schemes for blades and governor are electrically heated, thermal system of either the external or internal heating element type.

The external system uses rubber heating elements mounted to the leading

edges of the blades and to the governor casing.

Internal system utilizes a tubular seal, sheathed heating element, bonded along the filler in the leading edge of the blade, supplemented by rubber elements connected to the inside of the glass on either side of the leading edge.

The rubber heating elements are also used on the inside of the governor surfaces.

An alternate heated-type thermal system operates with heated air from a propeller-mounted burner or from other sources, ducted through both the hollow blade and the governor.

## Boosts Webbing Life

A new process for treating strands of Nylon webbing used in parachute harness, to boost the part's service life, has been devised by the Air Materiel Command's airtex lab.

Marlon BA, in the experimental area, said it does not guarantee the fibers but believes it is an advance in garter separation and fraying.

Adding moisture tests, in which the material was pulled back and forth over particles between hooks, showed that the treated webbing exhibited three times the wear resistance of the untreated type.



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## NACA Reports on Sweptback Wings

One of the keen research problems handed to the National Advisory Committee for Aeronautics was to obtain data on various types of swept-back wing planforms suitable for transonic and supersonic airplanes.

A report is now available as part of the very broad study devoted to investigating the lift and lateral control characteristics of an unswept, low-aspect-ratio wing. The problem has been extended to cover different degrees of sweep and the use of 25 per cent chord plan attached flaps on a series of various swept and tapered locations. A limitation to this particular study has been set by considering only low-speed characteristics.

NACA Note—One small section of the overall problem has recently been reported in NACA Tech. Note 2169, "Wind-Tunnel Investigations at Low Speed of a 45-Deg Sweptback Unflapped Sweptback Wing of Aspect Ratio 1.50 Equipped with 25 Percent Chord Flaps Flap." Authors are Harold S. Johnson and John R. Hagenson, of Langley Aeronautical Laboratory.

This lengthy-described wing was tested at flap deflections up to 60 deg. Lift, drag, pitching moment and bending moment data were obtained.

The wing tested had a 45 deg sweep back, an aspect ratio of 1.50, and a taper ratio of 1:3. Sections nearest to the leading edge were NACA 65A010.

Tests were conducted in the 7 x 10 ft, 300-wpk tunnel at Langley, at a dynamic pressure of about 100 psf. Corresponding Mach number was 0.77. Reynolds number, 6,300,000.

A variety of flap spanwise locations were tested at an sweep as seven flap deflections.

In General—The investigation yielded general conclusions about the behavior of the particular wing revealed.

First of these was that the trends in lift, drag, pitching, and bending moment due to angle of attack, flap deflection, flap span or location, were similar to but of different magnitude from those for straight wings.

Second was that the existing methods (both theoretical and empirical) for predicting lift effectiveness at these conditions were checked well with the experimental results.

Third was because of the decreased lift-drag ratio with flaps deflected, there might be an advantage in limiting flap deflections to 30 deg, at the expense of slight gains in lift coefficient at the higher angles. If stream slide panels are used, then flap deflections could be increased above the arbitrary defined value of 30 deg.



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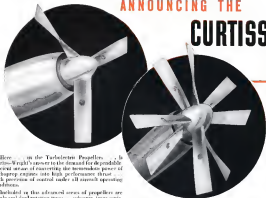
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► The development and introduction of the Turboelectric series highlight Curtiss-Wright's leadership in the successful manufacture of high capacity aircraft propellers. More than three-quarters of all propellers built today for use with aircraft engines of 3000 horsepower and more are built by Curtiss-Wright. No other organization anywhere. Curtiss-Wright's demonstrated ability and experience in producing high horsepower... ability and experience which, blended skillfully with the results of forward-looking engineering research, have produced the Turboelectric.

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► The Turboelectric are now only in the areas that they are specifically designed for use with turboprop engines. Most of their major features and components... and the principles of operation on which they are based... have already been proved in service. Like

their piston-engine counterparts, the Turboelectric are distinguished by:

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**Standard or limited-life design.**

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► The refinement and adaptation of these proved Curtiss-Wright features to the special requirements of the turboprop engine were successfully accomplished through an extensive research and development program dating back to 1943... and marked by great flying, standard service and actual flight tests.

► As early as 1946, Curtiss-Wright turboprop propellers were flight-tested on the TG-100 turboprop installed in the AC-119 experimental airplane. Two years later, the possibilities of the Turboelectric were spectacularly demonstrated by another of its predecessors. Fitted in a T-35 turboprop installed in the nose of a special five-engine B-37 "Flying test stand," this propeller flew the airplane with the propellers of the four wing engines feathered.

► With the development of the Curtiss-Wright Turboelectric propellers, the aviation industry can look forward to more complete utilization of the gas turbine engine's possibilities.



The Turboelectric series is the result of extensive research and development of gas turbine engine propellers combined with Curtiss-Wright's years of experience in increasing high horsepower. Among the early tests of a complete Curtiss-Wright turboprop propeller was one made in 1946 on TG-100 engine installed in the experimental AC-119 airplane shown above.



Propelled solely by a propeller of the Turboelectric Propeller line, a high-powered B-37 turboprop in the test, this special flying "test stand" gave a spectacular high demonstration with the four propellers of its wing engines feathered.



The world's largest and highest capacity propeller is a Curtiss-Wright Turboelectric. Designed for use with an extremely high-powered turboprop engine, this 17-foot diameter, eight-bladed light metal one now being tested by the Air Force, employs the steel reaction principle developed by Curtiss-Wright in 1941.



The advanced electro-mechanical pitch changing mechanism and other features of the Turboelectric series are based upon experience gained through thousands of hours of operation under stresses of temperature and altitude with the world's largest production propeller built by Curtiss-Wright and used exclusively by the Air Force in equip its airplanes of B-24 intermediate bombers.

► For brochures describing the Curtiss-Wright Turboelectric Propellers, write Propeller Division, Curtiss-Wright Corporation, Caldwell, N. J., on your company letterhead.

# CURTISS WRIGHT





## Canberra 2, by English Electric



**WING BEAM** of Canberra Component assembly as fit (right) and completed beam. Note ribs in the rigid construction of wing spar ribs.

**OUTER PANEL** leading portion shows heavy box structure, composite wing spar.



**RIGHT WING** shows delta-type wing leading edge forward approximating wing. Dense wing root pattern of skin panels and lower air engine wing suggest integral tail tanks in leading edges of Canberra's thick wing panels.



Canberra Mk. 2, initial version of England's fast jet bomber, is now in production. It will be the first version of the Canberra to enter service with the Royal Air Force.

Mk. 2 carries a three-man crew in a pressurized cabin, navigation instruments from Mk. 1 are transparent plastic nose landing and warning can post hole.

Wingspan of Canberra is 64 ft., length, 55 ft. 6 in., height, 15 ft. 7 in. Power is from two Rolls-Royce Avon jet currently developing over 6000 lb. thrust.

At recent SRAC Fairbairnhigh duplex, plane demonstrated maximum transonic speed combined with high speed.



**COWLING** jobs are being polished over attachment points on forward portion of semi-monocoque structure. Thin ring mounts against double wing to wing post, shape appears heavy enough to carry some engine load.



**TAIL SECTION** is that of Canberra Mk. 2 (X116) displayed on first floor of SRAC Fairbairnhigh show. Glass thick and grey both across members of its leading edge, toughness of remainder. Steel, rounded tail cone may be substituted across housing. English Electric in full production on Canberra Mk. 2.



**SEATING** arrangement for Canberra's pilot in this cockpit and being lowered into "cooler" cockpit.

**FUSELAGE** structural member in structural layout of plane. Panels of several acrole temp., reserve wing hinge and secondary string. Acrole temp. wing root shape and use of bench bar. Fairbairnhigh is completed with addition of tail section and cockpit.



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**Thin Airfoil Section**  
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The high-speed aerodynamic characteristics of thin airfoil sections are well known by now. Not so well known are their low-speed characteristics.

The National Advisory Committee for Aeronautics has recently issued Tech Note 2172 "Low Speed Characteristics of the Stalling of a Thin, Fined, Double-Wedge Airfoil with Nose Flare." **▶ Altered Section**—The airfoil tested by the NACA was a modified double-wedge section, derived from a symmetrical section of 4.5 percent maximum thickness. Midspan portions of the airfoil were rounded, top and bottom, with use of a circle tangent to the 45 and 97.5 percent chord stations. Resultant section thickness of the airfoil was 4.25 percent chord.

It was known that the stalling characteristics of this particular airfoil section could be improved with the use of nose flaps, and it was this particular type of flap that the NACA dealt with. Four different flap chords were used—10, 30, 50 and 75 percent of the mean chord—and the flaps were connected to the model by a continuous hinge.

**▶ Comprehensive Studies**—NACA's investigations covered force characteristics, pressure distribution and flow studies for the basic airfoil and the flapped sections.

Results showed that the basic section (a flapped) stalled due to flow separation from the upper upper surface, first observed at the leading edge at a small positive angle of attack. When the angle of attack was increased, the distance required for the separated flow to reattach increased.

With the nose flap deflected less than angles of 30 deg, stall behavior was similar to that of the basic section.

When the flap was deflected to an angle which was greater than 30 deg, flow separation started at the trailing edge when maximum lift. Positive effect of the deflection of the nose flap was to delay the start of leading-edge separation.

There were no significant differences noted in stall characteristics with variations in the flap chord used at least over the range of ratios considered.

Since normal values of maximum lift coefficient for a 12-percent chord nose flap basic section is 8.86, 13.4 for flap deflection 10, 29.4 for flap deflection 13.3, 36 for flap deflection 1.25. These are section data and apply for the modified double-wedge section at a Reynolds number of 5,500,000 and a Mach number of 0.17.

Authors of the Tech Note are Leonard M. Rose and John M. Adams, of Ames Aeronautical Laboratories, Mail Stop 150-1.

**B-36 Engine Tests**

Consolidated Vought Aircraft Corp. is representing B-36 flight data with new use in a new engine test stand to duplicate a section of the craft's long wing, awaiting an R-1600 engine stroke.

Purpose of the TV Worth engine installation is to check overall life of engine components and obtain performance data on the engine and its accessories.

The poppets used on the test stand's R-1610 is a Curtiss-Wright open-ported blade set with five tips to combat compressibility effects. Present B-36 production prop is runnapped. Reliable surveys indicate that all B-36 coming off the production line will be fitted with the square-tipped set.

Company's ground test setup allows a series of successive runs and permits accumulation of certain engine data more rapidly and conveniently than in flight tests.

The test stand simulates conditions of the B-36 installation in engine ground runs, full military thrust power, cruising speed, and operation at intermediate speeds.

The stand's large lower work platform is moved back under the wing section during runs, to provide prop clearance.

**Flight-Test Video**

Feasibility of television as a flight testing aid to reduce the pilot's workload, especially during high speed maneuvers, has been proved in two war-torn F-34 (A-14 Douglas Phantom and Navy SR-71).

Results already indicate that the TV pilot will be successful and ready for application soon.

According to the Central Air Development Office Technical Data Dept, one or two video systems will replace the pilot, to record all instrument readings, in both night and daytime. Two Air Radio units from the ground will control maneuvers of the high-speed craft. The pilot will still be used to handle routine flight tests.

The Air Medical Command's equipment lab and electronics subdivisions are working closely with technicians of LOR, Inc. and the Philco Corp. to power TV for the flight-test aid.

Low temperatures are developing the remote control system for automatize the craft from the ground. Present Navy AF remote control systems can duplicate most, but not all, instruments. C-130 remote, but the LOR development is expected to overcome this. Philco engineers are working to make TV adaptable to severe flight conditions.



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# Ask Alcoa for these Flight-Metal Training Aids

Alcoa's complete library of design and fabricating information on aluminum and magnesium is available now to help you train new employees—add to the know-how of your experienced men. Prepared by specialists, these

sound films and technical manuals are a condensation of Alcoa's 62 years of light metal experience. They can help to solve your design problems, save precious time in specifying, fabricating, and in testing.

## SOUND FILMS ...for Group Instruction



**FORMING** Both hot and cold metal, semi-hot and mechanical forming, extrusion, rolling, use of tools. (24 minutes)



**DRAWING, SHIMMING, STAMPING** Fabrication of Alcoa films, log on various types of press, alloy sections. (22 minutes)



**BURNING AND FINISHING** Deep layout, tool designing, setup, fabrication practice, maintenance, care of tools. (12 minutes)



**TENS AND SHAPE TESTING** Control methods for handling round and square shapes. English and metric sections and tests. (12 minutes)



**WELDING FILMS** Resistance welding. (15 minutes). Arc welding (12 minutes). Torch welding (17 minutes). Division techniques and equipment.



**HOW TO BRAZE ALUMINUM** Furnace, dip and torch methods. Braze some proper preparation and control of temperature. (7 minutes)



**HOW TO MACHINE ALUMINUM** Various contact practice including use of hand and machine tools, setting screw gauges, square, levels. (12 minutes)



**HOW TO RIVET ALUMINUM** Balls of hot and cold riveting, use of hot riveted rivets, riveting of good and bad practice. (20 minutes)



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**FORMING ALCOA ALUMINUM** Describes various fabricating methods, explains forming characteristics of aluminum alloys. 44 pages, 17 tables, 25 illustrations.

**RIVETING ALCOA ALUMINUM** Covers strength and properties of joints, riveting methods, selection of rivet alloy, rivet setting. 36 pages, 17 tables, 19 illustrations.

**MACHINING ALCOA ALUMINUM AND ITS ALLOYS** Discusses tool life, various machining methods, cutting speeds and feeds. 68 pages, 5 tables, 21 illustrations.

**WELDING AND BRAZING ALCOA ALUMINUM** Useful also manual on all welding techniques, including braze-ting. Describes various methods of braze-ting. 130 pages, 18 tables, 22 illustrations.

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**DESIGNING WITH MAGNESIUM** Complete guide to specifications, includes alloy properties, form variables, fabricating instructions. 234 pages, 72 tables, 59 illustrations.



## HOW TO GET WHAT YOU NEED

All sound films and technical manuals described are available through your nearest Alcoa sales office. If you prefer, send your request to the address below. Manuals are free. Films may be borrowed or purchased, for use in your 16mm or 35mm sound projection. For more complete details on all Alcoa films and manuals, send for your copy of the "Alcoa Library" booklet. ALUMINUM COMPANY OF AMERICA, 1800K Gulf Bldg., Pittsburgh 19, PENNA.



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ROHR-built power package for the Lockheed Constellation.



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Circle 16 on Reader Service Card

## SALES & SERVICE



TUNA BAITED Piper Super Cub 105 miles a day inland. At night, a well equipped



motorist has Conroy towed a drifting rig.

### Striking It Rich in Oil and Fish

Dealers create new markets by demonstrating value of seaplanes to tidewater oil men and tuna fishers.

By Edwin J. Balkus

The Piper seaplanes opening from San Diego's taxi fishing fleet and the Conroy fishing consulting experts to oil fields in the New Orleans delta have at least one thing in common. They are both good examples of how alert aircraft distributors can create the oil and fishing scenes. Pick the biggest business in your area and capitalize on it.

In each of these cases two people have been and being sold—airplanes and boats. The Piper seaplanes were sold by World War II, the large San Diego taxi fishing fleet came under the ownership of M. C. Morgan, a local boat operator at nearby National City, who saw possibilities in exploiting the re-construction market of light seaplanes to aid the local operators in fishing.

The Portage fishermen had a big problem. Before they could land the lucrative tuna grounds they had to stock up with bait, and loading bait was a time-consuming process.

Morgan knew that a plane, notwithstanding the boat, would extend the bait hunter's view considerably, even evaluate and pick out the most lucrative locations. The average man would be tremendous—only making up the cost of plane and fuel needed.

He estimated that there were about

200 boats in the area capable of landing planes.

He convinced the fishermen on the basis of all-oral construction and sold two Lescoches, showing ruggedness and easy maintenance, and also lined up pilots to fly them.

Further orders came in and caught Morgan in a dilemma—Lescoche had gone out of business. Morgan had to get a new source of supply of planes. It turned out to be Piper and then by another act of circumstance Morgan had to convince the fishermen all over again on the reliability of fabric covering. That bit persuasion was effective in evidence by the fact that he has sold about 20 of the 15 planes now shipped.

He now plans to set up a seaplane base and then he plans to handle the considerable maintenance of these units.

▶ Selling the Oil Men—The development of tidewater oil fields along the New Orleans delta has been turned to good advantage by Conroy dealer Jack Puchner, head of Delta Air Service, New Orleans.

The oil field operators in this area cover large tracts containing drilling rigs to oil wells along the marshlands, where they work with rousing about 10,000 ft deep. One of the important problems in the operation is positioning a certain road vicinity to protect the sides of the well from col-

lapsing until the piping is put into place. Analysis and treatment of the mud is handled by specialized mud companies who visit the sites.

Because of topography there will also pose a real problem of accessibility. Surface travel takes at least a day, even under favorable conditions.

Puchner analyzed the situation and then the product itself. He contacted the local consulting firm and worked out a contract deal to transport the equipment to the well sites. As the system he gave the engineers flight instruction.

When the consulting firm found that an engineer could visit five sites in about a 24-hour time using a floatplane, six of the first planes was practically sold. Now there are about 25 Conroy 170s engaged in this operation. Puchner having sold six of them in one month. And in addition, he handles all the maintenance and service. He also visits the operators with enthusiasm, so it is taking modified of the company's commercial field production.

The delta-based operator uses the potential plane market in this area of activity, ranging in between 200-300 hours. Puchner is in a very good position to get the lion's share of the business because of the pioneering he has done and experience he has gained.

It's a plucky business. The customers will fly to the extra custom paint schemes from the factory, two new models, and the 140, running Conroy 170 price close to \$10,000. In about five years he has realized approximately \$45,000 in clear commissions in sales as a result of this operation.



**"ZIPPER WING" IN FLIGHT**—New in flight plans of wood strib being tested by the Lockheed personnel on a modified DC-6B glider to explore boundary layer control. Continuous slot on top of wing seals off air. Slots near trailing edge appear to be ribs for test purposes.

## New Views of Foreign Planes



**CESSENA** two-place sport plane, Model M-2 (right) is all wood, with fixed gear. It is powered by a 75 hp Pratt D engine and cruises at 115 mph. Span, 32 ft.



**BEECHCRAFT** biplane de Transport Technologie Inc. designed and built several lightplanes for research purposes. The T-PF 31, powered by Continental 55 hp. engine (span, 25 ft., speed, 132 mph.



**ECHINO**, another Beechcraft design, is powered by a Continental 75 hp engine. Like the T-PF 31, it is a wood construction with plywood covering. Span is 22 ft., stalling speed, 120 mph.

## NEW AVIATION PRODUCTS

### 'Zips' up Plane Flaps

A movement, increasing part for itself which contributes to lift is among overall maintenance efficiency and speed a new "zipper sealing zipper" developed by R. F. Goodrich Co., Akron, Ohio.

The zipper seals the fabric flap used on some planes, which acts off the space between a control surface and structural member (for example, between rudder and field). One half the zipper is attached permanently to the plane structure, the other is oriented or moved to the flap which is itself constantly operating against air control surfaces on the B-16, B-47 and F2V, Goodrich reports.

The zipper quickly seals a seal that previously required the tedious removal, then replacement, of a long row of screws. The part features like a conventional zipper except that the metal teeth are covered by overlapping rubber lips that provide a complete seal from one pressure up to the structural strength of the material. The zipper currently is speeding removal of cow-diel surfaces on the B-16, B-47 and F2V, Goodrich reports.



### Obstruction Light

Lancet in a varied line of aviation items available by Dowag Aircraft Co. is an early mounted marker-obstruction light for use with night vision.

The model, identified by the name "Lancet," can be mounted directly in a 1/2 in. diameter pipe or used, without need for elbow connections or other intermediate attachments. Side of the light housing carries 1 in. internal pipe circular flange. The unit meets 23 CAA and AN requirements, except emergency use.

It carries a lensed type red lens and accommodates a standard 108A1 incandescent lamp in the position light socket. The eye point is waterproof and corrosion resistant, can be provided with holes for condensation drainage. It weighs less than 4 lb. Address: P. O. Box 4170, Ft. Worth, Texas.



### Small Actuators

Two new rotary actuators, originally developed for a pod action lighter plane, have been placed on the equipment counter by Avionics Accessories Corp.

These units, "Micro-Act" Models R-111 and R-112, are adaptable to vinyl tape motion and similar applications. Both are identical in performance, but the latter model has provision for a position indicating potentiometer or other suitable position switch.

Weights about 1 lb. each, they feature lock-limiting switches that may be adjusted to any value up to 90 lb. in. The motion between travel limits is controlled by adjustable, positive stops which cause a reaction on the load limit switch.

These actuators comply with Specification AN-M-40 including radio noise and integral heater requirements. The firm: Avionics, 25 Montgomery St., Elmhurst 5, N. Y.



### Photographs Day

A camera for recording flight and other engineering data following a design drawn up by engineers of North American Aviation Corp., is being prepared by the Fairchild Camera and In-

strument Corp., Pasadena, Calif. This compact, rugged camera—three module system type—has been engineered to operate efficiently and accurately under severe environmental and operational conditions, Fairchild says. It has been tested and found satisfactory through temperatures from -50 to 180 F., at altitudes up to 12 C and altitudes up to 60,000 ft.

The unit carries interchangeable Mitchell magnitudes of 400 to 1000 f/8 apertures and has integral mounting or can be fitted with a remote version of lens mountings. Design permits film speed to be smoothly adjusted from 1 to 16 frames per second with a constant exposure rate, regardless of frame speed.

The camera also can be operated a single frame at a time, triggered by hand or by electromagnets.

Lenses, mounted in a focus-adjusted mount, have close definition, high resolution and light transmittal qualities the firm states. A precision optical recording film mount cover is used during recording and is replaced after the shoot is powered by roller. The camera is 10 1/2 in. x 10 1/2 in. x 10 1/2 in. Contact: Avionics West Coast Division, 33 W. Union St., Pasadena 4, Calif.

### ALSO ON THE MARKET

Two-tone lift track, in a variation of existing hand guide, now has speed device which picks up, retards and dumps heart-timed parts from pot which it then returns to starting level. The firm: Avionics, 25 Montgomery St., Elmhurst 5, N. Y.

Radio and lens are out at high speed with an automatic "De-lens Power Pacer." "Pacer" still has stock up to 3 in. dia., drive cuts with precision and a de-rotational rate to desired conditions. Made by O'Neil-Frame Mfg. Co., Lake City, Miss.

Three-wire coded socket switches, multiple-throw (6-point) type, are designed for operations in restricted areas. These switches in Poly-Tel form are 1/2 in. dia.—lower than the previous models will fit. Made by Flash Tool Co., 7734 S. Hope St., Los Angeles 17, Calif.

Improved handling and protection of machined or polished parts is provided with use of adjustable "peg rack one stop." Designed to accommodate parts of various sizes, shapes and weight, one stop is made by fast moving, plastic reciprocating member, properly positioned for fast handling. In the machine operation. Made by Rock Engineering Co., Channahon, Ill.

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"... putting it mildly"



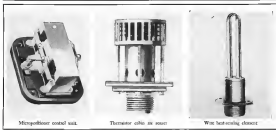
Flying from deepest south straight north through the heart of America, you pass into temperate climates almost any day of the year. No wonder Mid-Continent Airlines is glad to have dependable heating all along the line on a routine basis... with its fleet of 20 DC-3 standard equipped with Janitrol package heaters.

Thanks, Mid-Continent, for your letter, and congratulations on your record for one of the industry's best safety records... Putting it mildly, we believe you'll continue to find "Janitrol heaters" as important items to write into aircraft specifications. Your nearest Janitrol representative is always at your service...

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## EQUIPMENT



Microporous coated seat, Thermostat valve air source, Wire heat-welding element

## Improved Cabin Heat Control For 4-0-4

Barber-Colman system being designed into aircraft; vendor participating in prototype installation.

By George L. Christian

**Rockford, Ill.**—The 75 Martin 4-0-4s now on the assembly line for Eastern Air Lines and Trans World Airlines will be equipped with Barber-Colman cabin temperature control systems, the manufacturer has revealed to AVIATION WEEK.

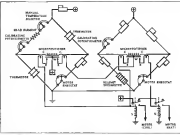
Already proven on such aircraft as the Constellation and DC-6, the 4-0-4 system of cabin temperature control should surpass previous installations in initial performance. There is a special reason for the maker's optimism in this regard.

EAL and TWA agreed with the Glenn L. Martin Co. that Barber-Colman engineers should be consulted on and participate in the design of the cabin temperature system prior to the construction of the planes. Thus, the vendor had opportunity to ferret out and avoid installation and operational pitfalls during the plastic stages of construction. Correcting deficiencies would be a more serious and expensive job after the aircraft was completed.

► **Fractional Check**—Barber-Colman will also be given the opportunity to make a fractional check of the first plane off the line and submit a complete analysis of the working of the cabin temperature control system with recommendations for improvements, if any.

W. F. Tice, the firm's temperature control specialist who has led its development since 1949, says and the first Constellation, left side this cooperation between the airlines, airlines manufacturers and vendors should be of advantage to all concerned.

► **Microporous Advantages**—Scott Brewer, Barber-Colman district engineer, explained that the basic advantage of his company's system over one-pot heating units lay in the acceptance of accommodations to supply the variable demand changes from the wire element as thermostat temperature sensing units and to transmit these signals to burner or actuator. Electronic amplifiers, embodying vacuum tubes



Schematic diagram of a representative temperature control logic circuit showing a typical microporous installation. Barber-Colman is designing a similar system for the 4-0-4.

not normally known, better and not easily available, for instance.

The actuators, which have many applications in aircraft control systems and thermal de-icing systems, cycle valves, etc.) actually in a 100,000-lb thrust aircraft magnetic amplifiers, capable of withstanding the most rigorous treatment in long periods without being subject to failure.

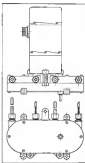
Although the Barber-Colman control system going into the 404 is fundamentally of conventional and tried design, it incorporates three interesting improvements over existing systems, according to Tice:

• **Radio remote valves** are used installed on the actuator. This is one of the first applications of radio to actuators in commercial transport.

• **Single actuator operates all valves** as well, although the valves are normally banded.

The manufacturer has taken a simple, mechanical, gear-operated, sequence-locking control of a design that had given trouble-free operation for years and made a double act out of it by increasing the forces on the single actuator, the assembly controls the actuator's bypass and heater gas valves through lengths of Teflon cable. Self-engaging cam hold after valve at the end of its stroke while the other one is in operation. A mechanical override is provided in case of actuator or electrical power failure.

• **Heat Senses—Control of the Martin system will rely on a new heat-sensing element placed in the valve and also on control valve in the valve or ducts, plus a thermostat in the cabin**



Line drawing of the newly developed valve system to operate the 404 as dual valve.

air stream pressure chamber. It is noteworthy that cabin-to-cabin or duct-to-duct air stream pressure chamber. It is noteworthy that cabin-to-cabin or duct-to-duct air stream pressure chamber. It is noteworthy that cabin-to-cabin or duct-to-duct air stream pressure chamber.

Each sensing element will control the air valve's actuator through a micro-pneumatic to regulate the valve just (or cold) to within approximately 1 deg. of the desired temperature.

Barber-Colman, whose roots are in the textile machinery industry, got into the aircraft field through the massive use of electric actuators, then among elements and microactuators. Also part of the company's diversified output are balling machines, which have found their way into major aircraft engine manufacturing plants where they are employed to cut gears to precise dimensions.

• **Practice Makes Perfect—Predicting its future on the premise that specialization leads to perfection, the company does not now intend to expand its field of endeavor. Rather it will concentrate on keeping ahead of the rapidly expanding demands placed on aircraft designers than central systems.**

Jet planes already present particular problems. Air bid of the turbines for cabin heating and ventilating creates temperature and velocity not encountered on reciprocating engine planes. These high speed and resultant low friction create new refrigeration problems, while higher altitudes demand increased fuel output.

Rate of response of temperature control system is becoming increasingly critical. Range of temperatures to be controlled are widening rapidly. Barber-Colman is confident that it can stay ahead of these problems with its expanding engineering and research facilities.



## Foldaway Seats Make Room For Cargo

A new folding airplane seat has been put on the market by Transport Equipment Co.

Gordon Jones, owner of the company, says that the USAF has shown considerable interest in the seat because a passenger airplane can be converted to transport cargo simply by folding the seats out of the way. A typical air lift

problem is landing passengers one way, freight the other.

Additional advantage is that two seats may be combined into a berth.

Also available is a triple, high-density seat which is interchangeable with the standard five seat and can be made interchangeable with the eight seat by adding two legs.

On a recent trip around the country, Jones says he sold his combination, two passenger seat to The American World Airways and Chicago & North-West, TECO, which specializes in any type of seat, has equipment on several other airlines—Trans World Airlines, Seaboard & Western, and Ocean Airways.

## AIR TRANSPORT



DE HAVILLAND DOWE, a possible choice of aircraft and turbofan, and the



FRANCE, in same category, stand to gain from expanded certification.

## U. S. Market Brightens for British

But obstacles may be reluctance to buy foreign planes and fear of being unable to get needed spare parts.

U. S. airlines and executives are now buying British 6-12 passenger planes like the De Havilland Dove, or Perseus, France without requiring the usual western certification by Civil Aeronautics Administration. Yet regional certification of turboprop and jet planes like the Vickers Viscount and de Havilland Comet is not yet possible.

That is the upshot of British-American talks that have frayed the month after five years of negotiation. Now all the British have to do is show Americans that the planes fit U. S. needs and that spare parts supply and maintenance problems are solved.

But on turbine engine plane, CAA wants to review the British standards of certification and test results before accepting their airworthiness. (The Society of British Aircraft Construction Board limited the CAA-Air Registration Board reciprocity agreement that month as a blanket invitation to jets like as well as conventional types.)

• **British Hopes High—The British think they may now sell their planes in the U. S. because:**

• **Only competitor in the 6-12 passenger field is the power-driven North coast DC-3, say the British, not an airplane for many loads, unneeded and obsolete.**

• **DC-3s are scarce or expensive now because of the recent pickup in demand for them under high government military and military needs.**

• **Low-passenger turboprops** played by Perseus and de Havilland may be just the ticket for low-velocity level Western Perseus. A turbo-prop like a DC-3 and have a Perseus—then occupying a new place and increasing working capital at the same time.

• **CAA-British Agreement—Civil Aeronautics Administration Donald Noyce recently told the Corbin law of such-and-similar law and type. He told the British Ministry of Civil Aviation that CAA would accept an up-to-date British (ARR) Certificate of Airworthiness as equivalent to that required for American-built aircraft.**

That makes the British plane acceptable for purchase in the U. S. But airlines must see that their

planes meet CAA operational standards.

Just how simple conditions stand in U. S. acceptance of British planes for airlines are now (contracted with many uncompleted ones being).

• **British certification must be as of 1945 or later.**

• **British manufacturers must write by flight manual to show how the plane meets CAA operational rules.**

• **Engine cooling must be okay for operation on a hot desert day.**

• **Plane must be equipped to meet requirements of the CAA operating rules.**

• **Both transport and non-transport categories of aircraft must be equipped in accordance with the appropriate operating rules of the United States Civil Air Regulations in order to be eligible for a particular class or type of operation.**

These are as follows: Part 45, general operation rules; Part 46, non-scheduled air carrier operation rules; Part 49 and 61, scheduled air carrier rules (domestic); Part 41, scheduled air carrier rules (foreign).

• **Seac Standards—Actually, U. S. standards are unchanged. ARR exceeds its own requirements two years ago paralleling those of CAA. And British tests give about the same things in American—only in a slightly different way.**

Observers say: Why then didn't CAA grant reciprocal arrangements in January, 1948, when the ARR revised its standards, or when Britain accepted the U. S. certification of American-built planes? Some answers are:

• **Technical specifications take time to study—to give their mutual standards set to another country.**

• **British had already bought some post-war U. S. transports, costing millions of dollars. They could ill afford to cut off their supply of U. S. certification, then purchase five or six more planes. And they could ill afford to take such retaliatory action against a country whose financial support was so important to them.**

• **Bad type, both U. S. and British, showed themselves agreement. State 1945 CAA has undertaken aviation laws while Civil Aeronautics Board has been more the rule-maker. In the U. S. State Dept. has finally dealt with CAA on this reciprocity matter. CAA, however, has for many years made most of the technical judgments on whether a plane is airworthy. That is its business.**

Administrative. Noyce finally wrote a short note to the Ministry of Civil Aviation, granting reciprocity subject to the conditions listed. He was able to do this almost immediately after taking office because CAA Chief of Aircraft Division George Holderness and his staff, along with former Administrator DeLoe Bentler had already studied and

drawn the matter with ARB in flight level and the British Embassy in Washington.

• **Little incentive for the British** to get CAA into the CAA structure. Outside costs could not be covered. Only one plane—the Dove—was an active bidder for the U.S. civilian market. Now some types are coming off the line. The Dove is a jet, followed by the Perseus. Present and the HP Merlin—all designed for similar roles as executive jets. Later will come the helicopter Viceroy, jet Conquest, and others.

• **His Air Differences—SAC** apparently remembered Nyrba's recent letter, which did not mention foreign planes as part of CAA expansion. Jet plan from automatic availability was copied, after then explicitly mentioned in the American agreement.

• **SAC** in its recent news letter and "The agreement applies equally to large airplanes like the De Havilland Comet and the Vickers Armstrong Viscount and to the smaller ones which have been placed on internal American air routes. All these aircraft are now being offered for sale on an equal footing with American built types."

Such is not the case. Jet aircraft were for U.S. operations will demand less and cost less. CAA's body CAA has planned certification standards for the Canadian Avro Jetliner almost twice as complex—just as Canada. But by the time the British asked CAA to consider the Comet, the plane was practically a production item. Talks on the British foreign plane have been referred to for CAA has indicated no detailed study of any of them.

• **Any Talked—Now**, the problem for the British is to sell their conventional planes for American dollars. According to SAC, the British aircraft industry reported 218 million pounds worth of planes and engines to all nations the last eight months of the year. But almost none of it went to U.S. markets. Now SAC is putting on a dollar

drive. It announced the CAA would also negotiate with these firms. "No technical obstacle now exists to the export of British aircraft into America... This is just good news..."

"I believe it, Americans have looked at buying planes built abroad, according to approved plans that have had other than American manufacturing might do to U.S. and jet airplanes going to its aircraft plant using things planes. But if a foreign plane were cheaper to operate, the complaint would be open to challenge."

Some people evidently in what American worry about cost. Here's why:

- **Debate** from the manufacturer might mean delivery not just losses, they find.
- **War** might include loss of a large manufacturing site loses other than building or exporting planes for U.S. markets planes.

Some already say U.S. buyers will cover take a plane with a foreign built jet as if an American because might have much better look before the British design. They say. They say the British could get their dollars from aircraft.

But now they have their airworthiness certification issued, De Havilland and Percival indicate they'll try it as their own first. Percival France has its long-purchase side as far as De Havilland Dove built a large Canadian space airplane, and Canadian manufacturers prepared to use one were not out of English sight.

Sales Director C. H. Deaton (Toronto, Canada) says the Dove now needs all CAA requirements. He hopes to go to the U.S. to look over and test-planes in the U.S.

And the Percival France's U.S. sales agent, Sydney Nathan of Atlantic Airways (Stouffville, N.J.), has a similar story.

Both Deaton and Nathan say they now have led sales prospects and hope to announce sales in the near future.

• **Dove Sales—Toronto**: Sales Director

Deaton says he hopes within one or two weeks to announce at least one U.S. order for the Dove. "The market is very good indeed," one for limited operations, the other for executive.

The Dove is offered detailed anywhere in the U.S. \$75,000—standard 4 passenger, 110-hp engine, about 575,000—executive 6 passenger, and 575,200—13 passenger leader.

De Havilland now has mostly limited making small changes on the Dove to meet all CAA requirements for passenger use on U.S. routes. Turboprop changes, now completed these months ago, and the flight instrument was corrected a month ago.

Advanced sales strategies on the Dove won't be open until next month because of De Havilland's people in Toronto are busy now on emergency new orders. But next month Deaton hopes to appoint U.S. distributors, distribute selling arrangements, and get some demonstration planes.

More than 360 Doves now in service, after two years production. Some parts supply for the U.S. by way of the through distribution located near the buyer. And to control sales eventually will be carried in Toronto, to serve American distributors direct.

• **Percival Sales—One** order for two Royal Powers is likely soon, and a second order is negotiating for two more Powers, one still pending. This will probably be a long-purchase deal if it goes through.

Percival has told Nylt the terms of such a contract set up yet. Represents, a would like to have only two present, plus monthly lease pay monthly payment, located production. One order has had representatives at Percival's plant in England, primarily negotiating on the long-purchase deal. "Nylt expects to get details of the proposed long-purchase sales in the near future."

Let press on the Percival, Sydney Nathan, a U.S. \$104,850. Quantity discounts in lease terms are subject to negotiation.

Price is designed for a normal load of 11 passengers plus crew of two (American Warps No. 3, p. 45)

## IATA Winds Up First U.S. Meet

San Francisco—Transportation director of IATA discussed the Miles Thomas as president-elect according TWA Board Chairman Warren Lee Benson, and director of London for the next working to be held late in October next year, marked the closing of the sixth annual general meeting of the International Air Transport Association.

Among the final resolutions approved were the election of IATA's new execu-

tive committee and approval of the 1957 budget. The new executive: FAA Vice President Harold Bird (executing FAA Vice President John C. Lofsky, Air France Deputy Director René Bréard, NWA President Cyril Thonet, TWA President Gordon K. McGeorge, Swedish Airlines head Per A. Nordin, and IATA President Dr. Alfred Peeters). All but Italy were selected or have previously served on the executive committee.

The 1957 approved budget provides for expenditures of \$60,000, with one item appropriated at \$13,000—balance would be drawn from surplus.

Also settled in the meeting was the location of IATA headquarters. It was decided to locate the head office in the city that is headquarters of ICAO. Previously at the meeting a resolution had been offered to prevent relocation of IATA quarters in Montreal in the event that ICAO moved to United Nations Building in New York.

## Ramspeck Cites Low Air Transport Cost

U.S. certified airframe of today have cost the nation only 541 million since 1935, according to Robert Ramspeck, executive vice president of the Air Transport Association.

That 541 million is the difference between air and pay to the nation plus showed cost of the postal system, less rural service, less 18-year annual deficit to the PostOffice in less than one year's deficit from sale of peony post-stamps, Ramspeck pointed out in the 60th annual IATA conference.

"It has," he said. "For the sum of 541 million, we have provided the largest air transport system in the world."

## AA Third-Quarter Net Tops Quarter

Third-quarter net profit of American Airlines hit \$5,825,000—double the last year's profit of \$2,988,823. Revenue was up 23 percent.

This brings year-to-date net earnings to \$7,251,540—compared with last year's \$5,974,730—after income taxes of \$2,616,800, computed at the new rate under the Revenue Act of 1950.

Nonoperating revenue of \$5,014,631 is up 10 percent over 1946, but expense of \$97,803,891, exclusive of federal income tax, are up only 2 percent.

American now available data indicates a "continues to be the lowest cost operator in the industry." Operating expense per revenue ton mile rose 10 percent at 45 cents, compared with 45 1/2

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Meets here, prior to joining the Clipper Four. The repair job marks the merger of ADA planes into the Pan Am fleet.

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cont's the first week of 1949.  
Annual output as of Sept. 19 is \$14,181,832. This is after providing for a loss of \$1,100,000 out of surplus layer dates of American's investment in Overseas Overseas Airlines, transferred to Pan American on Sept. 25.  
Passenger load factor the first nine months reached 64.4 percent, compared with 63.9 percent last year.

### NDTA Group Hears War Transport Needs

Coordination of air, surface and sea transport for most efficient defense movements of material for industrial and war machines was the goal of delegates to the 46th annual convention of the National Defense Transportation Association in San Francisco Oct. 16-18.  
Two airline presidents, R. S. Demore, of Trans World Airlines, and W. A. Patterson, United Air Lines, were among the speakers at the meeting, which called together both military and civilian representatives of the various transportation agencies.

Harold Ross, president of the NDTA, was Charles Nichols, Santa Monica, Calif., director of plans and services, Lockheed Aircraft. Glenn vice president representing the air industry was James W. Austin, Capital Air Lines.  
► Air-Sea Needs—Both Demore and Patterson pointed out the need for additional air transport to serve the country in the event of all-out war.

Demore said "The problem arose at least partly because the needs of air transport were overlooked in the needs for combat aircraft in budgeting appropriations immediately after World War II. Therefore, at the beginning of any war it would probably be necessary to requisition a considerable part of the few military aircraft owned by the civil airlines in addition to the military transports which are in our hands."

"Even so, there would be a great deficiency, and it would be necessary to construct a large number of transports immediately, not when our aircraft factories would be jammed with orders for combat aircraft. This is a desperate situation, for which some proper solution must be found."

He was particularly concerned about the failure of some members of the military that in case of war the air transport system should be placed under military control.

In World War I, he recalled, the military was forced to appropriate a good part of domestic airline equipment and personnel to meet the emergency. By operating at extremely high load factors, the domestic airlines were able to handle a heavy traffic volume even with their low remaining aircraft. Unfortunately, however, "the cost of

fuel was required by a lack of efficient technical air transport," he said.  
"With the record of World War II behind us, there should be no excuse for such an occurrence in the future," he declared.  
It is clear, he believed, that domestic airlines should remain largely under civilian control. "The civilian industry through trial and error and competition have developed the most efficient organization to produce and to carry goods."

► 6000 DC-6—Patterson spoke of his estimate on having approximately that year's defense needs will for 5000 DC-6s. The commercial industry could never replace that number of transports with out high subsidies allowed as rates to become comparable to those for government transportation, he said—a device that might well destroy the networks and structures.

To have a part of that cost, he believed, the military would simply have to buy transports in its budget allocations, "padding" them when they were not needed for war.

He also hoped that the military would plan so that it would not have to "cash-alike" domestic air transport in the event of a third world war.

Under Secretary of the Navy Don A. Keesell, who also spoke at the conference, advanced thinking the airlines is "powerless here" if the military is to count on them to a source of planes for emergency use.

He mentioned that 95 percent of the more 50,000 members of the armed forces in level status at any given time under peacetime conditions should be available by air. Such a practice would serve two valuable purposes, he said. It would assure rapid transportation for those who need it and provide the airlines with needed revenues.

### Baker Sold on Jet Airliners

National Airlines President G. T. Baker is well sold on jet airplanes. He says some doubt whether to place an order for Canada's Avro for use on the Mississauga-New York route, 34 hours, compared with conventional four-hour trip.

Baker hopes to bring the Avro down to Miami for a test, possibly within a month. Presumably this would follow approval by Canada's Department of Transport. The Department is cooperating with the U. S.'s Civil Aeronautics Board on tests and certification requirements for the Avro.

The plane has been in the shop several weeks for overhaul and modification.  
After every 50-hour flight time inspection job over all parts of the plane and postflight. Final certification ap-

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port around, CAB officials say, but the location of when flying for the long-haul passengers is likely to be conventional. Designed to operate at about 30,000 ft., it has a long wing sweep-back and a moderately thin airfoil. But the cabin is highly pressurized, and the plane is fitted with dive brakes.

**Foreign Phase-**Boeing says jet three-portions won't take five to eight years, is commonly predicted to see how you today. But with no American policies in sight, foreign airlines will have to be used.

Despite certain initial disadvantages in training, maintenance and operation costs, Boeing predicts maintenance will be less than on planes having sweeping engines. Boeing says jet won't be used through the Denver engine shops as F-104 and F-105 did. It will run in one 1800-cylinder but may exceed 20 jet engines a week.

To overhaul the same number of parts against a jet, says Boeing, 1500 man would need a 40,000-sq-ft-hall size.

### Higher Coach Fares May Lower Service

Two scheduled airlines say drop their coach fares, leaving Civil Air Route (CAR) Board's ruling that coach fares must go up by 41 cents a seat.



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But Chicago and Southern's announced plans for dropping the Chicago-New Orleans route was a major investment difficulty, not firm, says Ben K. Gillespie, CAB chief of travel and service.

Western Air Lines has filed for cancellation of its coast-to-coast, Seattle-San Francisco. United Western design an application to a jet seat level before the Nov. 15 deadline, it will probably be without coach service at that cost. CAB probably would not grant a waiver on this route segment, officials say. But Western is possible registering its revised approval of the line rather than requesting to drop the service. A representative of the line has talked with CAB officials about the matter and the company may soon apply for a 41-cent seat.

Western's position on the Seattle-San Francisco segment is not tied to the special 1-cent-a-mile San Francisco-Los Angeles coach rate (see *Airways Week* Oct. 9).

### Germans to Charter Civil Aircraft

(McGraw-Hill World News)

Rome—The Allies have announced that they will allow West Germany to charter civil aircraft. An Allied spokesman said that embargo that had been levied for security reasons.

Germans will have to obtain a license for each flight or series of flights from the Allied Civil Aviation Board at Washington in the United States area if the Civil Aviation Board finds there is a threat to security. It will refer the application to the Allied Military Security Board, which grants approval and authorization in Germany.

### NSRB Committee to Survey Air Transport

Civil air transportation plans may take shape before water's end, now that the National Security Resources Board has set up a committee to make an air transport mobilization survey.

NSRB has named CAB Chairman Delos Beetsel as coordinating chairman of the study. The study groups received mainly by industry area will report by Jan. 15 on what should be done about civil air mobilization.

Presently, committee recommendations will follow much of the plan outlined by CAB Aviation Development Advisory Committee. That a general part of the field of the new committee, except for the air transport centers. It was approved the month by CAB Administrator Donald Noyce (see *Airways Week* Oct. 9).

The key study group of the NSRB committee are:

- Air transport (including and included) under Air Transport Area Vice President Milton W. Arnold
- Training, aviation, maintenance, as the William J. Calkins, of Foster Airport, Pittsburgh
- Private flying, under George E. Haddock, editor and publisher of *Southern Flight magazine*
- Airport, under A. E. Gray, director of the Dodge County Port Authority, Miami
- Always, under G. A. O'Reilly, president of *Airways Week, Inc.*
- Strategic Plan—Beetsel called the first meeting of the study groups Oct. 11 in Chicago. He suggested they report back about the first of next year with their recommendations. Right now, there is no overall plan on how air transport centers will be affected by war.

To get the thing done simply and quickly, Beetsel says the study groups must be small as possible, without depriving any important industry segment of representation. Private and other entities in the supply on all committees. That is the most NSRB mobilization planning set up.

## SHORTLINES

► **American Airlines**—Is pushing more flight hours for next summer, with regular routes being boosted by state boards of aviation. Company has placed ALFA flight to Geneva July of \$405-\$605 a month, 85-hour flight (see past month's issue, and other substantial benefits).

► **British European Airways**—Delos Beetsel ordered lifting 25 passengers of the total 29 aboard. Plans plowed through by into a London suburb while trying to make it back to field as one engine.

► **Canadian Pacific**—Has nearly all flights to the end of the year booked solid. Company starts direct weekly air service, Vancouver-Honolulu and return, in January. This is an addition to the long-haul Vancouver-Honolulu-Pip-Aeroflot schedule.

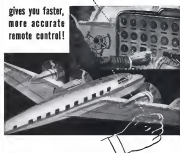
► **Capital Airlines**—Made a net profit of about a quarter of a million dollars in August. On revenue of \$1,764,916, necessary toward an operating profit of \$347,993 and net of \$213,221.

► **Chicago & Southern**—Has ordered a New Constellation, for delivery about June.

► **Flying Tiger Line**—Has started making flights by its from Southern Cali-

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Series to Eastern sites. This is occupied under an agreement with the Foreign Manufacturers Association of Southern California.

►ICAO—Has sponsored a South Pacific conference saying that transport air up long range radiofrequency facilities across the ocean. This would replace the present Morse Code method. But language barriers make airframes will be needed at ground stations until a voice code is devised.

►LAV—The Venezuelan airline has awarded Lockheed Air Service (N.Y.) a contract to modify two 749 Constellation by replacing older Curtiss-Wright propellers with hydraulically actuated Hamilton Standard.

►Network—Has filed to get CAB permission to serve Valdosta, Ga., Tallahassee, Panama City, and Marietta, Fla. as intermediate points on route No. 51 in flights between Tallahassee and Miami. Motion of Hesters to consolidate National's application with other similar applications is deferred by the Board.

►Company has granted maintenance employes a 10-cent wage increase. It comes out is estimated at about \$184,000 a year.

►Northwest Airlines—Has failed to get temporary CAB exemption to serve Seattle and Portland as co-terminus instead of serving both on the same flight en route No. 7 with Yakima as intermediate stop. Northwest says its present short-haul service is satisfactory and same Seattle-Portland route. Company has CAB permission to serve West Falls, Mead, or Seattle or Helms trip, but can't give local service between.

►Pan American—Has granted increased pay to pilots and copilots. Pilots get guaranteed wage plus bonus that depends on type of base flown. Pay is now based on 70 hours a month, instead of 80. Co-pilots get increased pay and better 70-hour month. Pan Am has opened a new Washington sales office in the World Center Bldg.

►Southwest & Western—Has filed a brief to CAB for certification of U.S.-Europe-Middle East extra route, without subsidy. ... Carrier wants cut average DC-4 load on Pacific routes to 13,500 lbs. and August audit capacity was 15,000 lb. July DC-4 airplanes on the airline run 12,100, 13,000 daily.

►United Kingdom—Airways corporation cleared 179,000 passengers in 1967, up 13 per cent over a year ago. Passenger index of 75 million was up 34 percent.

## LETTERS

### He's a Racer

After participating at the Continental Trophy Race in Detroit on Aug. 10, 11 and 12, I naturally felt compelled to accompany the best driver and co-driver on the biggest race of my life in Atlantic Works.

The sole crew of ones that appeared was an excellent Atlantic Works Sept. 4) discussing the best engine of the fast track which I had the satisfaction of winning from my position in the cockpit next to being the fast track. I'm sure of motor reliability have felt while leading the aviation race. I am happy and satisfied with the excellent handling of the car.

Your main point that no more will be added to general air race rules (in discussing public expression of a local term) very clear. A person should avoid an opinion about the situation. The discussion of aviation safety has made it possible to actually establish a search facility and a driver. I support the idea that the more public method of a travel program is to tell the customer the best person of the especially high airline level of safety from the beginning.

In my opinion it is best to ensure that one in two low altitude race facilities per year will have an excellent facility for additional people to look at either. Duplicating our group of people of one of their clients would mean of itself for so detailed a benefit to provide results of the group would likely be dissemination of the very extreme end, if we wish to make an legitimate business relations.

Now your letter addressed apparently places you in opposition to the growing airport class of racing in which the program provides the best facilities for the most detailed of students and competitors. Original design. Already significantly advanced might mean design and flying, and though they are not generally accepted, such systems are not over the top with my opinion. It is possible that you are not committed to continue to build a solid aviation and construction efforts.

Market value has proven to be the best between local and national air facilities to obtain the maximum of the commercial market in beyond financial means, but who really want change of financial means to justify his choice. It encourages me to build and fly airports beyond that would otherwise stop progress beyond the starting stage. Could the building of the start of a race of air that country that could individual enterprise as its most visible source of motivation?

It is true that the market and I think having done a few sets in the face of the market. I wish that you a little further, and make a few more.

which from the public treasury.

The 1957 race which I had done along the same lines as the other race was an early race for Atlantic. Even a lot to do in your race plane (which is a racer) to make the first degree experience of multiple race of regions in being well served. In the best of safety spirit which Atlantic Works seems to start its endeavor. CAB's we would depend Atlantic Works to continue its share of its management to what I believe to be a full sense of an excellent.

Armen B. Bevanian  
251 Bayview Drive  
Cupertino 1, Ca.

(Our "man power" is that we must not work what a pilot. If we can see how to get out of the spot, let's do it. And if you're looking for a moment at that matter you're getting into our way. It is, by itself—Ed.)

### Nonask Delays

I have followed with a good deal of interest your comments on the nonasked-on carriers, and I'm very happy to hear that they are very much in your hands.

July Sept. 11 should bring to mind my letter had regarding this item—I think it is more than that they refuse, and I know the conditions is widespread, from which carriers.

Here's the best I believe to make better the passenger is subjected to long delays in airplanes—and has an idea why, it is when he may expect to take off. If he is told, let's make them that you're first in the standing list. Subsequent events sometimes indicate that the information was given without any regard to the facts.

Any passenger on a ground vehicle that he's going to make something, his knowledge is not to take off. I think that he may have to wait 15-20 minutes and that he'd wait a good deal more good information if he had a definite idea as to how long he will wait.

A remark made in the discussion of a transportation flight into Oakland, 78 minutes late, and a delay of 10 minutes, and further waiting around, was delayed for five hours without explanation.

Now mark that the carrier has been 10 minutes late and here the field would be delayed for several hours at long.

The broader impression is that they are not a carrier of passengers would have to get the flight when it was finally ready to depart, but that's not a good enough reason—they were to continue to drive their.

I'm in favor of the market and I think having done a few sets in the face of the market. I wish that you a little further, and make a few more.

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### WHAT'S NEW

#### New Books

"By press-and-by-goth" having may have found the aircraft designer and draftsman will look on the design and airplane more than things which have shied at only 300 mph or so, but now such modern methods are obsolete. Any three-dimensional surface on a sphere capable of slipping its way up to and through some spots must be developed with great care. Extreme caution must be used to avoid any rapid changes or results of aerodynamics.

Although draftsmen hate to admit it, the mathematical approach at the end only one which can be used to develop accurately based curves and streamline shapes. To set knowledge, the first book which covers this very important aspect of aircraft design has been written by Harry H. Hennis, a developmental engineer at Republic Aviation Corp. It is **The Analytical Development of Curves and Streamline Bodies**.

In a foreword to Hennis' book, Republic's Alexander Korvick says that the method "... proves to be very successful in generating wings and streamlined bodies, and in having the interaction between the two bodies. In fact, the efficiency of the method is so great that it has now been adopted and copied other methods previously used by the engineering departments of the Republic Aviation Corp.

There is another advantage to using mathematical expressions for the development of curve bodies. Volume and surface areas of bodies as developed can be quickly calculated by this way, whereas in the old method of planimetering the area under a curve of measured positions.

Development of the equations is also given in Mr. Hennis' book, but only elementary algebra and calculus have been used in the derivations. The reader at our door need not have to be a mathematical slouch to be able to apply the results. Published by the Design Co., Astoria, N. Y., Price is expected to be \$4-100A.

Reviews of U. S. Air Cadet Academics, calendar year of 1948, details reports in scheduled, regular and Alaska operations. The academy set shows according to the class of operation and from the standpoint of date, location, operating equipment, total personnel aboard, transport division among crew and passengers, aircraft damage, whether accident happened at night, and if so in the air or after impact was reached. Edited by the Chief Astronautical Board, Washington 25, D. C.

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## Why Sneer at Air Freight?

We continue to be amazed at a considerable straggle toward air freight and its future by people who should know better.

One of the most recent nonacademic outbursts of polemic, of course, is the staid expression's report recommending to the Civil Aeronautics Board that neither all free all-freight airplanes be certificated on the civil lines-Aviation trade laws because prospects for air freight between the U. S. and Europe are so poor that no new loads is justified.

Neither of the two applicants requests a dollar of U. S. government aid pay. Obviously, the Board could grant such all-freight certificates on a short-term trial basis, as it has the precedent, if it is worrying about "losses" of business from the interferences and subsequent need for higher mail pay.

The members ignore the tremendous potentialities of international air freight. He ignores aviation's ability to take business away from inferior surface transport and the ability to create business that does not now exist and would never exist if high speed air transportation were not available. He also fails to explain why the same reasons the Board found for certifying all-freight carriers within the United States don't apply to the U. S. Europe trade lanes.

This we also know the internationally expected founder and president of KLM Royal Dutch Airlines concerning almost automatically on air freight in an address before the International Air Transport Assn. In an address in which he looked forward to building up high-density traffic on the world's trunk lines, he hardly considered that "some" attention must be paid to developing air freight.

Dr. Finlayson wants to sound very much too much pessimistic-minded. There are other top airline executives like him in this respect. If you don't believe it, take a poll of airline cargo directors, including those who give up its digest and quit their jobs over the past few years.

Also, look at the air cargo traffic statistics of the industry to the year before the current air freight lines ceased since the present. In other words, we believe that we'll find the profit and direct and comparative of the standardized all-freight carrier in order to develop air cargo to its maximum stride and efficiency.

The CAB member and other skeptics notwithstanding, an cargo's growth is phenomenal. Robert W. Prescott, who has had to battle every inch and every government agency and prejudice and legal public-opinion to the passage of a CAB certificate—without raising or getting any U. S. money—is an expert on that freight development business.

He told the California Manufacturers Assn. that air freight ton mile traffic will exceed 100 million ton miles this year, against 190 million last year and 10 million in 1945. He points out that the country, concentrate New York, Pan Am Authority, after an 18-month survey, forecasts that air freight traffic by 1950—in this country alone—will be nine times that year's volume. Prescott, himself, thinks it will be eight times that year's business by 1955. He is more conservative than the Pan Am Authority because he thinks costs will decline faster.

It is good that Bob Prescott himself talks about costs, be cause along about that point on our remarks on air freight some businessmen always mentioned fairly behind a slide and always pointed that you can't fly freight economically in today's airplane. But when the ideal money-making cargo they comes along, wow, will we carry the freight.

We finally point that the all-freight carriers are not yet in second financial ground from freight transportation only. Doing airplane maintenance for others is improving income for a few.

But the frequent load complaints about the state of effort, emanating from some of the so-called carriers, seems a bit pitiful. Because the certificated mail passenger carriers themselves have to the fastest system who their own actual air freight cases are. Second, every certificated surface has now and has always had wide freedom from CAB in developing and carrying freight in either scheduled or non-scheduled aircraft. And their non-scheduled charter ships have never even been restricted to their certificated cities. Yet the scheduled air freight they have carried was thriving until the Slicks and the Presidents—and a lot of others who went bankrupt—began selling and flying freight. The amount of unscheduled freight flown by the mail passenger lines is still significant. This is not here criticism. It is fact.

The cargo carriers realized that without cost pay the going would be tough. They were no longer than the certificated lines near about airplane operating costs. They aren't yet. But they didn't sit on their hands growing about the slide rule math. They knew that few companies ever start in black ink, and they were ready to let their margins spread enough wide and financial run. If they can stay in the black with occasional unprofitable work on others, while they best down the freight costs, we think aviation and the public are the winners. Doing maintenance for others, at a profit, best paying lot in owed to the government for higher mail rates. Where is the stigma in the maintenance business, please?

Several major airlines do not have extra outside man transfer work for other operators for years. And what's wrong with that? Maybe they could reduce three government aid pay if they sought and made money on some of this kind of business, instead of continuing the freighters who do it profitably and hold up the freight business too.

The freight carriers, by their own stupidity and selfish interests, are getting a good service to the public, are fighting today's operations costs and bearing the losses by their own. The more business they get the lower costs will go.

You can sit waiting about high costs till December. But you can't get the best, most complete, cargo planes on other way than this waiting out actual operations.

We think the world's potential is on air freight beyond our dreams. But in order to win it, there must be more open mind at government and some airline management circles. And the business isn't going to materialize out of thin air. You must fight for it. Give those who want to fight for it a chance to do so. If they can win without the aid of government subsidies, it's worth trying.

—Richard H. Wood



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